JUNE 1983

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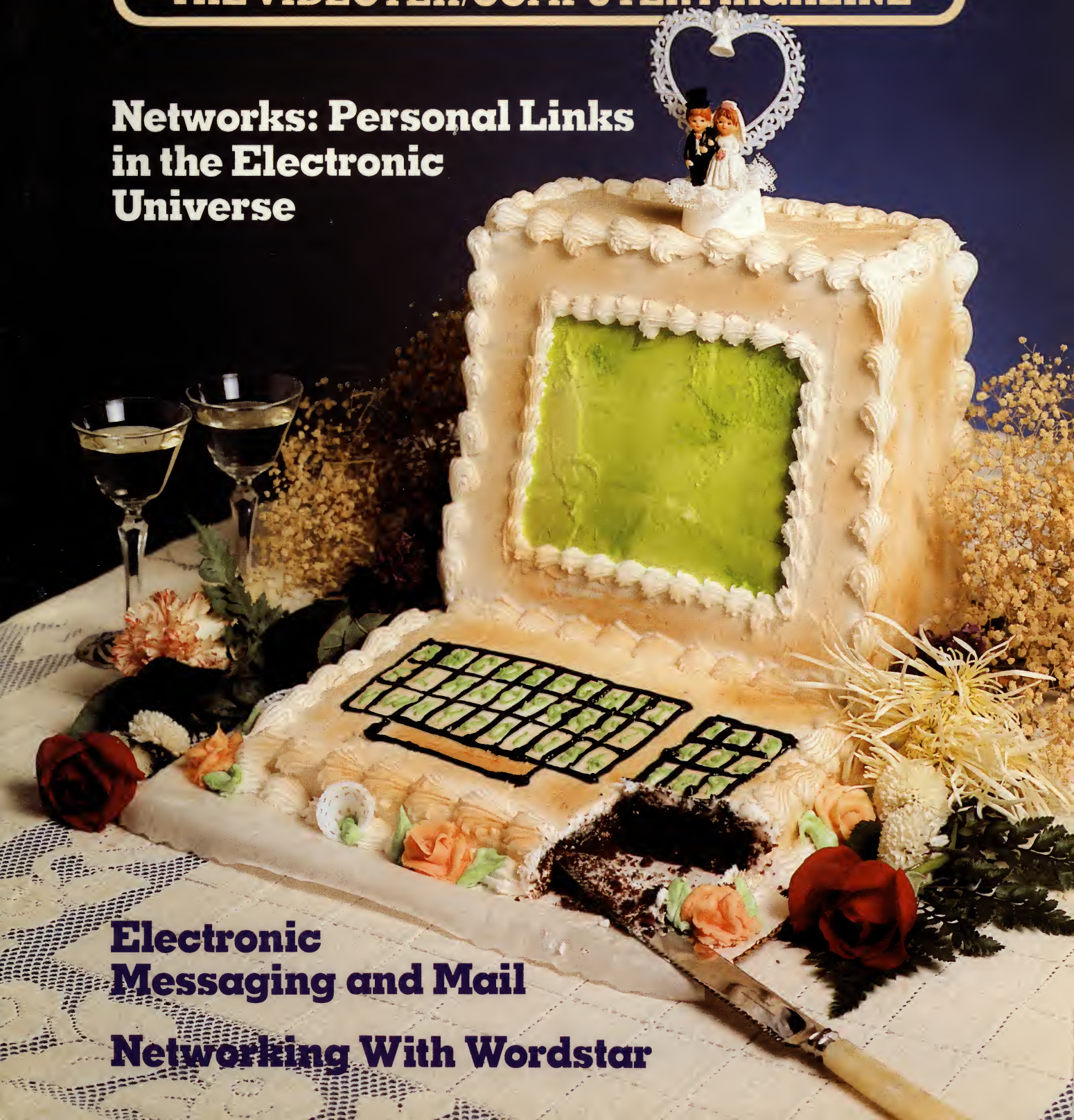
# TODAY

THE VIDEOTEX/COMPUTER MAGAZINE



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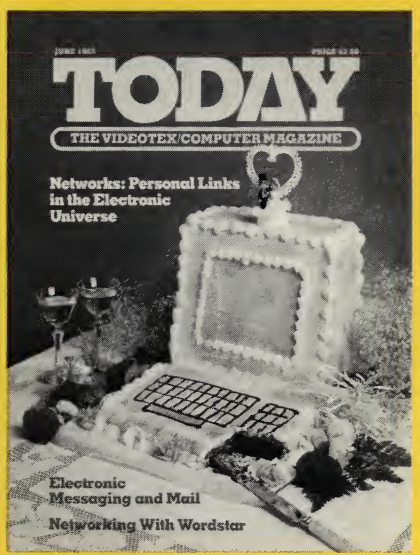


**Cover**
*"An On-Line Wedding"*
*This month TODAY looks at the social, technical and practical applications aspects of networking.*
*Cover photo by Illustrated Alaskan Moose.*

☐ VISISCHEDULE ☐ SUPERCALC ☐ VISICALC ☐ WORDSTAR ☐ D.B. MASTER ☐ MULTI PLAN ☐ VISIFILE ☐ dBASE II ☐

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# Letters

*Please address your letters to CompuServe electronic mail, ID number 70003, 1372 or to: Editor, TODAY magazine, 5000 Arlington Centre Blvd., PO Box 20212, Columbus, OH 43220. TODAY reserves the right to edit letters for length, content and clarity.*

### Computer Care

I read with some interest the article "Taking Care of Your Computer" (April 1983). Unfortunately, if anyone followed all of the recommendations in this article, they would spend at least an hour a week on maintenance; put each component at least three feet apart and sit in the middle of a large room with a perfectly controlled power supply and climate.

It's true that if they followed all of the procedures, they would be reasonable safe from all dangers. However, it seems to me that an article like this is really a disservice to your readers because it makes the precautions so burdensome that most users will be overwhelmed to the point of ignoring all precautions.

A more modest proposal — while not guaranteeing against every eventuality — would be much more likely to be followed. A better article would have described such a program, with a troubleshooting guide for addtional steps to arrest recurring problems.

Finally, instead of trying to forsee every possible risk, users need to be reminded of the common sense approach of anyone interested in protecting data: Making one or more data backups is the best protection. Not only will backups guard against data loss due to outside forces, but it will give you something to retain if you accidentally wipe out a record or file. It's a lot easier to keep your backup in an isolated location in a closed box than it is to maintain a perfect computer environment. This simple precaution and a little common sense cleanliness should be enough for most micro computer users.

Charles Gellert
Archivist
National Archives and Records Service
Washington, DC

I just received my first issue of TODAY. While I hate to be a complainer, it appears you are in the same boat as most of the current crop of "small computer" magazines. That is: Technical articles are mostly cases of the blind leading the blind. The result is usually harmless and often amusing, but sometimes there is something so wrong that it needs to be clarified.

On page 25 of your April issue is a recommendation to use a diskette drive cleaning kit frequently. I presently have manuals for five different makes of diskette drives, and each of them has some language similar to this: Do not attempt to clean the head. If you feel you must mess with it, use only a soft, lint-free cloth or lint-free swab and 91 percent or drier alcohol. This warning has been reinforced in many user-groups, including one of a company that sells the cleaning kits!

There are several other disputable recommendations in the article, and I would propose these guidelines for non-technical users: Keep the system covered when not in use; keep diskettes in the envelopes at all times when not actually in the drive; keep diskettes not in current use in an enclosed box or storage unit and read the manuals that came with your machine. Do as they tell you. Finally, do not listen to any advice from anyone unless you are sure that he has had a similar system running longer and with fewer problems than you have.

# Electronic Bounce Back

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To enter the Electronic Bounce Back program, choose item 11, User Information, or GO EBB.

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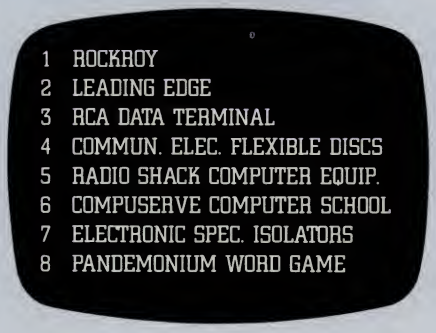
After the introductory information, you will be prompted for your name and mailing address.

**Step 3**
A menu of available issues will then be displayed.


*Example:*

After entering the issue of your choice, a list of advertisers will appear.




*Example:*

**Step 4**
After choosing an advertiser, you will be shown the list of following options:


**Step 5a**
Selection 1 displays brief product descriptions.

**Step 5b**
Selection 2 sends your name, address and ID number to the selected advertiser. You will also be presented with a Comment option. You will be given three lines to make your request to the advertiser.

**Step 6**
After completing your request, the option menu (step 4) will be redisplayed.


# Electronic Bounce Back puts you into direct contact with our advertisers.

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EBB not only lets you respond to an ad with the usual name and address information, but it also allows you to ask for specific information, leave additional comments or in some cases even order a product. The advertiser in turn can reply, if so desired, through our electronic mail system, Email™.

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# Letters

I hope these suggestions will keep some of your readers from fixing themselves into a trip to the repair shop.

James C. Matthews
Montgomery, Ala.

*TODAY magazine will stand by Ernest E. Mau's article as a safe and sound approach to preventative microcomputer maintenance. Mr. Mau's article is based upon his own extensive professional experience and thorough research for an upcoming book, Protecting Your Micro: A Guide to Care and Maintenance (Hayden Book Co. Inc., 1983). We would like to point out that Mr. Mau warned against performing maintenance procedures that could conceivably lead to voiding of service contracts and warranties — specifically opening and cleaning disk drive units with swabs. When in doubt, contact your computer manufacturer or authorized service technician.*

### VisiCalc

Mr. Lynott's article "Getting the Most Out of VisiCalc" (April) will be a boon to VisiCalc users everywhere. I have been struggling with the problem of maintaining running totals on several financial reports since acquiring my personal computer. However, the dilemma of "circular references" has always gotten the best of me!

Now, if Mr. Lynott would go back to the drawing board (or his computer, as the case may be), and translate his article for "Multi-Planners," I will have overcome the obstacle of "circular references" once and for all!

Jack Dunigan, CPA
Medical Associates
Chelmsford, Mass.

### Playing Doctor

Dave Peyton's story in the May 1983 TODAY, "Playing Doctor with a Computer" vividly describes a solution to a problem the educational community has been grappling with for years — how to make learning fun.

The key to making the computer a valuable teaching tool is to use it creatively, much as Marshall University has done in its school of medicine. Computer Aided Instruction, where the computer simply runs a program and students sit with bloodshot eyes hypnotized by the screen, is a waste of the machine's resources. While CAI does have its uses (for example, the computer doesn't mind repeating something over and over for the benefit of a slow learner), the contribution personal computers can make in education is where the real excitement lies.

Imagine budding attorneys at Harvard trying sample cases presented by a computer, bantering objections and overrules with the prosecuting attorney who is also "on-line" using a computer in another city. Or picture the computer challenging a structural engineering student to design a bridge to span a river which cuts a rather awkward path through a city. The applications are endless.

Samuel Ross
Miami, Fla.

# Letters

### Playing Games

I really enjoyed reading your games issue (May) and especially enjoyed the profiles of America's top game creators. As an amateur programmer, I've tried my hand on a few games of my own. Most people think that a computer game creator must lead a pretty easy life. From firsthand experience, I wholeheartedly agree with Larry Shelley: Glamorous it's not!

Phil Canter
Minneapolis

I noticed TODAY's cover story on multi-user games ("Interactive Gaming," May) covered multi-user games extensively, but not the multi-person games in the Game Special Interest Group on CompuServe.

In the Game SIG, players sign into the live conference area of the SIG and play chess and other games in real time. There are also on-going games in various sections of the message board that are conducted over a period of days or weeks.

Charles McGuinness
Fountain Valley, Calif.

### Industry Watch

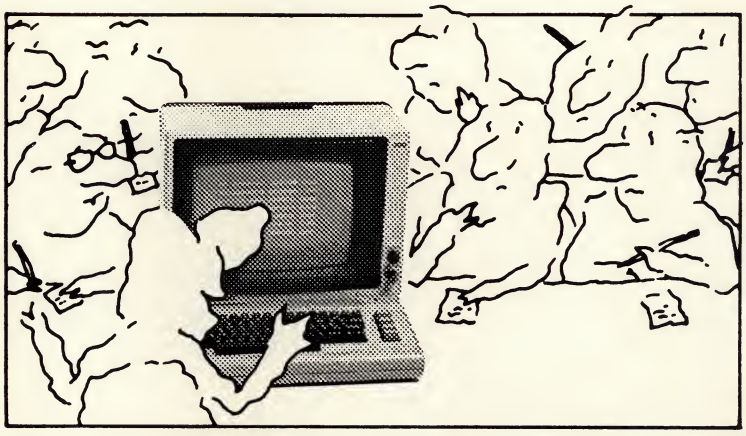
One of the first things I look at when TODAY magazine arrives is the Industry Watch section that lists new products and services. I think this is a good service to your readers. I find one thing annoying about the section, however. You don't list the telephone numbers of the companies that offer the products. Many times I'd like to inquire about a product or service and would rather just pick up the phone and make a call than go to all the trouble (and delay) of writing.

Do you suppose you could put telephone numbers in future Industry Watches?

Len Huntsinger
Metairie, La.

*Industry Watch listings will contain telephone numbers beginning with the August, 1983 issue.*


# Tired of waiting?



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# Dear Reader,

## TODAY'S ELECTRONIC VILLAGE

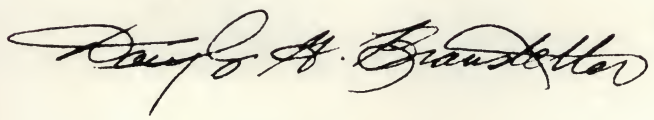
The computer network is the heart of the New Society envisioned by futurists and science fiction enthusiasts. Networking enables us to do just about everything imaginable within the confines of our homes: Work, study, shop, bank, communicate and play. Alvin Toffler's "electronic village" is unfolding before our eyes today — at this moment.

In this issue of TODAY, we examine some of the social implications of this new form of human interaction. Although computer networking as it stands today represents only the merest fraction of its potential, the technology is already raising social questions. Will we turn into a nation of hermits, never to leave our electronic cocoons? So far, this seems to be an unfounded fear. Most people who make extensive use of computer networks also lead vigorous, normal lives and still crave personal contact. They see the computer network as an irreplaceable tool — a means to an end and not an end in itself. (See "Living the On-Line Life," page 17).

How will computer networking change the quality and nature of personal communication? Again, all the answers seem to point in a positive direction. From enhancing the efficiency of business communication (page 21) to more intimate forms of communication ("On-line Vows," page 15), networking seems to have proved itself as a viable alternative to more traditional forms of communication.

In upcoming months, TODAY will examine how computer networks and videotex are revolutionizing publishing, small business and the home. As with most forms of large-scale change, there is social resistance to networking technology at all levels. Large publishing dinosaurs refuse to consider electronic publishing — partly out of fear and partly out of ignorance. Business executives refuse to participate for the same reasons and others: A computer keyboard perched on the desk might look "clerical." At the individual level, fears of privacy invasion — not entirely unfounded — play a major role in the reluctance to participate.

For every example of resistance (for whatever reason), there are examples of how networking and videotex are being used to dramatically increase efficiency, save a business or enrich a life. When you see these examples you're bound to ask the same question as we do about social resistance. That question is, "Why?"



*Douglas G. Branstetter*
*Editor*

# ULTRA Diskettes

## Now...Diskettes you can swear by, not swear at.

Lucky for you, the diskette buyer, there are many diskette brands to choose from. Some brands are good, some not as good, and some you wouldn't think of trusting with even one byte of your valuable data. Sadly, some manufacturers have put their profit motive ahead of creating quality products. This has resulted in an abundance of low quality but rather expensive diskettes in the marketplace.

### A NEW COMPANY WAS NEEDED AND STARTED

Fortunately, other people in the diskette industry recognized that making ultra-high quality diskettes required the *best* and newest manufacturing equipment as well as the best people to operate this equipment. Since most manufacturers seemed satisfied to give you only the everyday quality now available, an assemblage of quality conscious individuals decided to start a new company to give you a new and better diskette. They called this product the *Ultra* diskette, and you're going to love them. Now you have a product you can swear by, not swear at.

### HOW THEY MADE THE BEST DISKETTES EVEN BETTER

The management of *Ultra* Magnetics then hired all the top brains in the diskette industry to make the *Ultra* product. Then these top bananas (sometimes called floppy freaks) created a new standard of diskette quality and reliability. To learn the "manufacturing secrets" of the top diskette makers, they've also hired the remaining "magnetic media moguls" from competitors such as Verbatim, Memorex, Dysan and many more. Then all these top-dollar engineers, physicists, research scientists and production experts (if they've missed you, send in your resume to *Ultra*) were given one directive...to pool all their manufacturing know-how and create a new, better diskette.

### HOW ULTRA DISKETTES ARE MANUFACTURED

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**1. TOTAL SURFACE TESTING** - For maximum reliability, and to lessen the likelihood of disk errors, all diskettes must be totally surface tested. At *Ultra*, each diskette is 100% surface tested. *Ultra* is so picky in their testing, they even test the tracks that are in between the regular tracks.

**2. COMPLETE LINE OF PRODUCTS** - For a diskette to be useful to you and your computer, it must be compatable physically. *Ultra* Magnetics has an entire line of 5¼-inch and 8-inch diskettes.

**3. SPECIALLY LUBRICATED DISK** - *Ultra* uses a special oxide lubricant which is added to the base media in the production of their diskettes. This gives you a better disk drive head to media contact and longer head and disk life.

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**6. DISK DURABILITY** - *Ultra* disks will beat all industry standards for reliability at well over millions and millions of revolutions. They are compatible with all industry specifications as established by ANSI, ECMA, ISO and JIS.

**7. CUSTOMER ORIENTED PACKAGING** - All *Ultra* disks are packaged 10 disks to a carton and 10 cartons to a case. The economy bulk pack is packaged 100 disks to a case without envelopes or labels.

**8. LIFETIME WARRANTY** - If all else fails, remember, all disks made by *Ultra* Magnetics, (except bulk pack) have a lifetime warranty. If your *Ultra* disks fail to meet factory specifications, *Ultra* Magnetics will replace them under the terms of their warranty.

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| 8" DSDD Soft Sector (Unformatted) | **82701** | 3.19 |
| 8" DSDD Soft Sector (1024 B/S, 8 Sectors) | **82708** | 3.19 |
| 5¼" SSSD Soft Sector w/Hub Ring | **50001** | 1.79 |
| 5¼" Same as above, but bulk pack w/o envelope | **00153** | 1.39 |
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| 5¼" SSDD Soft Sector w/Hub Ring | **51401** | 1.89 |
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| 5¼" DSDD Soft Sector w/Hub Ring | **52401** | 2.79 |
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| 5¼" DSDD 16 Hard Sector w/Hub Ring | **52416** | 2.79 |
| 5¼" SSQD Soft Sector w/Hub Ring (96 TPI) | **51801** | 2.49 |
| 5¼" DSQD Soft Sector w/Hub Ring (96 TPI) | **52801** | 3.49 |

*SSSD = Single Sided Single Density; SSDD = Single Sided Double Density; DSDD = Double Sided Double Density; SSQD = Single Sided Quad Density; DSQD = Double Sided Quad Density; TPI = Tracks per inch.*
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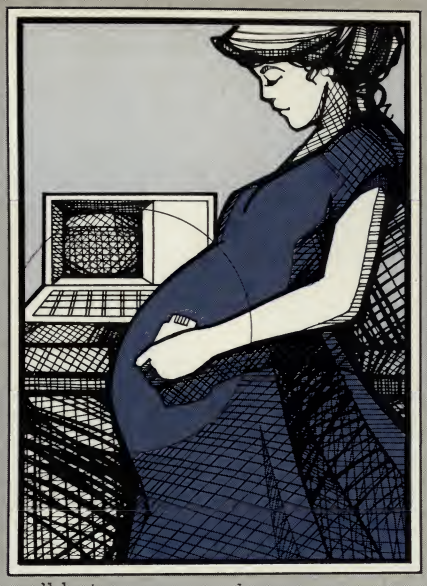
## HOME FETAL MONITORING

To check the health of her unborn child, Jenny Smith performs a daily ritual as soon as she awakes. She removes a memory card which has been clipped to her clothing and inserts it into a receptacle in her home computer. A graphic display appears on her computer screen, illustrating the number of movements made by the fetus each hour during the past day.

Through her computer network, she accesses her doctor's office computer and transmits the day's record of fetal movements for his review.

Jenny's scenario may not be commonplace until the mid-1990s, but the technology for such home fetal monitoring exists today, according to researchers at Battelle Memorial Institute in Columbus. Research scientists in Battelle's Applied Electronics Research Intelligent Device and Microcomputer Systems' Division have recently developed a method of using an array of flexible, paper-thin, pressure-sensitive transducers attached to a woman's abdomen to sense even minor fetal movements.

Because recent medical studies have shown that frequent fetal movement is an important indicator of fetal well-being, many doctors are now urging expectant mothers — especially those with high-risk pregnancies — to regularly count the number of fetal movements during a particular period of time.



Illustrated Alaskan Moose

According to Battelle research scientist Richard Rosen, the new technique employs a group of the coin-sized monitoring transducers which are painlessly attached to span a woman's abdomen.

"The movement that would be sensed by this is a conglomerate of all kinds of things — regular respiration, the fetal kicking and rolling over, the mother twisting and turning," Rosen said.

If produced on a large scale basis at today's prices, Rosen estimates the monitoring system, including computer software, could be sold to home computer users for about $100.

## HONEYWELL TO OPEN VIDEOTEX CENTER

Honeywell will open the nation's first public videotex demonstration and support center in Chicago in mid-1983. The new center, which will be located in Schiller Park, will feature two Honeywell DPS 6 small computers running Teletel videotex packages provided and supported by Videographic Systems of America (VSA). VSA is a recently formed New York-based joint venture of French telecommunications companies, led by Thomson CSF, that will market French videotex products in the United States.

Intelmatique, the worldwide marketing arm of French telecommunications administration, will provide a working database and magazines, along with a variety of editing devices and user terminals including the French Minitel product. Groupe Francais D'Informatique (G.F.I.), a Paris-based software firm, also will feature their implementation of Teletel videotex for demonstration purposes at the center.

In addition to providing demonstrations, the Chicago center also will be used to develop new videotex simulations and models and serve as a benchmark test site and training resource for prospective customers.

## CONTROL DATA INVESTS IN STC

An agreement has been signed between The Reader's Digest Association, Inc. and Control Data Corp. under which Control Data has invested in Source Telecomputing Corp. (STC), Reader's Digest's videotex subsidiary.

Under the terms of the investment, two senior officials of Control Data join STC's five-member Board of Directors. They are Walter H. Bruning, vice president of data services, and Thomas W. Miller, vice president of business development.

Other directors of STC include William J. Cross, vice president and treasurer of The Reader's Digest Association, Inc. (RDA); George V. Grune, vice president of condensed books, general books and recorded music at RDA, and chief executive officer of STC; and Ross Jones, assistant treasurer and investment manager of RDA.

According to Walter Bruning of CDC, "Control Data's long experience with delivering computer services will complement the strong information orientation of Reader's Digest."

STC's primary service, *The Source*, provides electronic information and communication services to more than 33,000 subscribers.

STC was acquired by RDA in September, 1980. Under the terms of its financial agreement with Control Data, Reader's Digest maintains its controlling interest in STC.

## VIDEOTEX 83

If telephones and paperwork are the bane of an executive's life, the remedy may be at hand in the fast-evolving information technology called videotex. Videotex, the generic name for the interactive transmission of words on television screens, creates an electronic network that can be used for advertising, directing marketing, and a broad array of publishing and financial services.

Videotex '83, an international conference and exposition at the New York Hilton, June 27-29, will offer a tour de force of the technology and its applications.

For information on Videotex '83, contact Pam Fendel at London Online, Inc., 1133 Avenue of the Americas, 33rd Floor, New York, New York 10036, (212) 921-2626.

## CRUSADE BY COMPUTER

To some, ignorance may indeed be bliss, but to David Nizen of Valley Cottage, New York, if it relates to the crippling birth defect called spina bifida, it's a situation to be remedied.

The high school junior, whose 14-year-old sister Jill was born with the disease, has directed his anger at her suffering into a constructive channel: spearheading the fundraising list for the Greater New York Spina Bifida Association. "Spina bifida occurs when the spine fails to close during fetal development — it's the most common crippler of newborns. It's seven times more frequent than muscular dystrophy," Nizen says, "yet, by and large, the public is unfamiliar with the disease."

Until 30 years ago, few babies with spina bifida survived beyond infancy. Now the majority survive with medical treatment to handle the accumulations of cerebrospinal fluid that would otherwise collect in the spinal cord and brain cavity. Treatment involves a shunt implant to harmlessly channel accumulations of cerebrospinal fluid into the abdomen. Infections and relapses are common, however, and a

Illustrated Alaskan Moose

strict regimen of care must be followed.

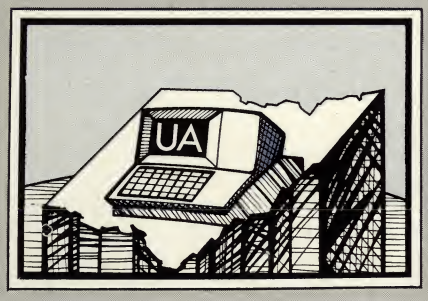
Nizen's involvement began in the fall of 1981 when the then 15-year-old contacted the Spina Bifida Association's president to offer his services. Initially skeptical that a young man barely in his teens could help the cause, chapter president Joe Gallagher nevertheless invited Nizen to meet the board and make his case.

A skilled programmer, Nizen was particularly well-equipped to assist the New York association in compiling the extensive list of potential contributors needed to facilitate fundraising. "They were compiling names manually on index cards," he recalls. "I told them I could list more names and do it six times faster. But I needed a printer, two disk drives and an expansion interface for my TRS-80. I'd had the computer for several years and it had only 16K of memory."

Although he didn't get as elaborate a system as he would have liked, he beefed the machine's memory up to 48K and has the printer and other parts needed to produce hard copy. Now, many hours later, Nizen has compiled a hefty list from such sources as phone books, corporations, Dun and Bradstreet listings, inside tips from friends who've smuggled him internal phone books, and about 600 hours in the library copying names from the Million Dollar Directory and other reference guides.

Last summer, Nizen slept only three hours a night in his big push to log 250,000 names. With his return to school, he cut back somewhat, but most evenings find him toiling in the glow of the terminal. Not surprisingly, Nizen sees his computer not as a source of entertainment — "I spent the first three years playing games" — but as a tool. "Now it's time to work," he says emphatically.

## COMPUTERTOWN-EAST




Illustrated Alaskan Moose

Recognizing that computer literacy is becoming a necessary part of our business, educational and even personal worlds, at least one American city is making an all-out effort to make its community computer literate. That city — Upper Arlington, Ohio, a suburb of Columbus and the location of TODAY's editorial offices — has been named ComputerTown USA-East by ComputerTown USA, a microcomputer literacy project funded by the National Science Foundation.

With this designation, the Upper Arlington Community Involvement Program (CIP), an organization that helps coordinate the resources of over 30 community groups in the city, has set into motion a series of comprehensive planning activities which involve a number of Columbus-area technical resources, including CompuServe, OCLC and Warner-Amex QUBE. Upper Arlington sits within a crescent of educational and research facilities, including Battelle Memorial Institute, The Ohio State University, Chemical Abstracts and AccuRay Corp., making it uniquely suited for such a project.

"Our basic goal is to offer an informal educational opportunity for everyone in the community to become computer literate. We hope to make it possible for the future microcomputer user to become comfortable, aware and informed about this technology," says Yvonne Simon, community coordinator of CIP.

As ComputerTown USA-East, Upper Arlington received no funds or grants, merely recognition. However, a number of companies and organizations pledged support by offering hardware and software equipment to the city if it secured the ComputerTown USA designation. "We're in the process of calling in those pledges now and setting up the equipment in the Upper Arlington Public Library, the official ComputerTown site and information hub of the community," Simon explains.

ComputerTown, USA is under the sponsorship of People's Computer Co. of Menlo Park, California and is funded by the National Science Foundation.

For additional information on ComputerTown USA write to P.O. Box E, Menlo Park, Calif. 94025.

# NETWORKS

## Personal Links in the Electronic Universe

by Carole Houze Gerber

"Networks," write Jessica Lipnack and Jeffrey Stamps in *Networking: The First Report and Directory*, "are the connections that make us one people on one small planet near one small star. They are our newest and probably our oldest social inventions." Whether used to seek information and advice, air opinions, or simply chat, the newest tool for facilitating all types of connections among people is the computer network.

Users become on-line neighbors who can transcend time and distance, access vast funds of information in network databases, and also establish satisfying personal and professional relationships. Hundreds of specialized networks have sprung up to meet the needs of doctors, lawyers, farmers, teachers, the handicapped, cooks, gardeners — name it and there's probably a network serving that group. More generalized networks, such as CompuServe's CB service, are of a social nature. Some networks are simply bulletin boards which list messages, events, and names of members. The more sophisticated networks are interactive, allowing for two-way communication between individuals and groups. They provide, as one proponent grandly stated, "a medium for experimental, emergent forms of communication."

### Purposes of networks

Networks can serve purposes as homey as swapping recipes, as personal as trading life stories, and as purposeful as conducting research. While many view computer networks strictly as a tool for rapid, widespread, and relatively inexpensive dissemination of information, others, such as New Era Technologies, Inc., President William Spencer, believe networks can return autonomy and power to individual users.

"Networks and networking have a new meaning today," says Spencer, whose Washington, D.C., firm designs and implements computer communications systems. " 'Network' is no longer synonymous with the big business of broadcast radio and television. It is the personification of a communication process that occurs between people with a common purpose who can wield formidable influence in a variety of decision-making processes. Networking via computer will strengthen these associations in signficant ways over the next twenty years, resulting in more direct public participation in production and use of new knowledge."

Spencer, whose firm markets a networking software package called M.I.S.T. (Microcomputer Information Support Tools) for CP/M-based micros, notes that with the exception of two-way radio, there have been few opportunities for the public to participate directly in broad-based communication activities. "By the end of the century," he declares, "the term 'communication' will be augmented to include information exchange among and between many people — that is, many-to-many communication." Spencer adds that the widespread and continuing popularity of radio talk shows points to a public eager to debate, air opinions, and even occasionally listen to opposing views. While it is possible to access a computer network simply to monitor information rather than to participate in an exchange, it's the rare user who is content to do so. Spencer maintains that active participation in computer networks will result in a "higher level of 'connectedness' that will stimulate and strengthen public involvement in the discussion and interchange of ideas."

### On-line interactions

Evaluating and studying this 'connectedness' is an area of great interest to social scientists. A recent book by sociologists Elaine B. Kerr and Starr Roxanne Hiltz, *Computer-Mediated Communication: Status and Evaluation*, takes a close look at the whos, whats and whys of on-line interaction. Fittingly, the book was primarily an on-line collaboration between Kerr, who lives in Worthington, Ohio, and Hiltz in East Orange, New Jersey. Needless to say, both are strong proponents of computer networks. One of the systems they use is the Electronic Information and Exchange System (EIES) at the Computerized Conferencing and Communications Center at the New Jersey Institute of Technology. EIES is a seven-year-old system dedicated to exploring the use of computers to facilitate human communication.

Kerr, who makes her living as a freelance on-line consultant and researcher, also serves as volunteer


**Technical staff at New Era Technologies, from left, Vice President Bonnie Oppermann, Senior Marketing Rep Lisa Rowland and President Bill Spencer: Marketing microcomputer networking support tools and banking on an on-line explosion.**

coordinator of EIES's other volunteer user-consultants. The first communication new users have on the network is a welcoming message from Kerr. An admitted "on-line addict," Kerr says she and Hiltz examined in their book more than 20 factors that affect acceptance of computer communications. These include the nature of the group, the nature of the task, whether users are working under a joint deadline, the type of leadership within the group and, quite simply, whether or not those on the network like and trust one another.

### Acceptance and rejection

"One of my major research interests continues to be the acceptance or rejection of these types of systems — trying to figure out why some people accept them whole heartedly and others refuse to sign on line at all," says Kerr. She and Hiltz, both Columbia University PhD.s, are now involved in a cross-systems study funded by the National Science Foundation to examine the "determinants of acceptance" of computer-mediated communication. "The purpose of computer networks is that they facilitate human group communication among geographically dispersed people," Kerr points out. "They allow people to communicate faster and cheaper than the alternatives — by letter or phone or travel." Her research includes, among other things, questionnaires, an on-line major psychological test of users on several systems, and the effect of the presence or absence of a human facilitator.

### Computer conferencing

One aspect of networking of increasing interest to groups with tight budgets and hefty agendas is computer conferencing. While they will probably never provide the warm glow that accompanies pre-conference cocktail gatherings, on-line meetings have proven successful for a number of groups. Possibly one of the longest was a conference on the future of education in Florida. Held from February 7 to April 3, 1980, the on-line meeting hosted 66 participants in Miami, Orlando, Palm Beach, Tampa, Gainesville, Tallahassee, and other Florida cities, as well as in Washington, D.C. Dr. Pauline Masterton, an associate for program policy analysis at the Florida State Department of Education, reports the cost to participants was modest: $4.75 for a cassette tape and printed materials, plus a computer usage fee averaging $50 for the seven weeks of the conference. "The relatively low level of participation can be attributed to the fact that most of the potential participants didn't, at that time, have easy access to terminals," says Masterton, who adds that the state has also used conferencing to reduce travel by state advisory committee members.

According to computer scientist Murray Turoff at EIES, developer of the first computer conferencing system, there are five situations in which computer conferencing is particularly appropriate. These include: a scarcity of time; a geographically separate group; a group with such severe disa-

**Terry Biener in full on-line party regalia: "On line, there can be an immediate meeting of the minds."**

greements that the communication process must be refereed; a problem so broad that more individuals are needed than can talk in a meaningful way face-to-face; and a situation where a supplemental group communication process is needed.

**Travel via computer**

While all aspects of computer networks, including electronic messaging, bulletin boards, databases, and conferencing, have become increasingly popular for business use, networks also serve large social, recreational and educational needs of personal computer owners. These users may well be the most enthusiastic members of the "network nation" referred to by Murray Turoff and Starr Roxanne Hiltz in their 1978 book on the subject. Whether they are accessing commercial networks such as CompuServe, The Source, or the Dow Jones News Retrieval Service, checking into the estimated 1,300 databases or nearly 500 free computerized bulle-

# ARE YOU A NETWORK ADDICT?

Like all addictions, a compelling desire to be on line can cut across the barriers that normally separate people. There are fat addicts, thin addicts, highly literate addicts, and addicts who couldn't spell "modem" to save their lives. There are addicts who cram on-line activities into a life bursting with the demands of family and friends, and addicts whose existences can only be described as drab.

If you suspect someone claiming to be simply an occasional user of a far more intense need for an on-line fix, don't look for delirium tremens, shifty eyes or tiny bags of illegal substances as tip-offs. Sociologists have studied the characteristics of addicts and hypothesize that there are several easily-recognizable symptoms. These include: signing on several times a day because of a firm conviction that a message is waiting; physical irritation when the system is inaccessible (depending on one's disposition, this can take many forms — from kicking the table to kicking the cat); a marked preference for composing thoughts and writing on line; a preference for on-line friends over those physically present; and a compelling need to sign on "just one more time" before falling asleep.

One network user says he feels a sense of purpose on line that he doesn't feel with other methods of communicating. Another says he has pretty much given up using the phone and relies mostly on electronic mail. A consultant for the Federal Communications Commission says being on line takes him into a "fourth dimension," away from his home and family. Are these people addicts? Most would classify themselves as such. Whether or not the addiction is bad depends on the individual circumstances of each.

Addiction, after all, simply means habitual behavior. Some people may be addicted to making their beds. Others to running five miles a day. And still others to a method of communication that many users say supplies an intellectual intimacy lacking in face-to-face exchanges. Sociologist Elaine Kerr, who works as a consultant on the Electronic Information Exchange System (EIES) training new users, says that once people get used to the medium the real person always comes through. "I think I could project a different image on line if I wanted to, but there's really no reason to do so. The system is informal — typos don't matter. It's the essence of what is communicated that matters."

Kerr, whose on-line addiction has given her a great deal of personal as well as career satisfaction, says that her face-to-face encounters have been influenced by the amount of time she spends on the network. She talks too quickly now, she says, because she's used to typing her words at lightning speed. She interrupts lengthy remarks because she's used to concise communicators on EIES, and she jumps around from topic to topic because she's used to carrying on five conversations at once on line.

What can be done to cure these users who are having such a fine time? The only recourse, says one happy addict facetiously, may be "regulatory measures to keep users from on-line enhancement of their lives."

*— G.H.G.*

tin boards, personal computer owners are enthusiastic travelers through the network nation. In lieu of knapsacks, these wayfarers are equipped with terminals, communications software packages, modems, telephones and cables to connect the two. In place of plane fare, they purchase connect time. Instead of walks to the library, trips to a colleague's office or anxiety-inducing forays to a singles' bar, these electronic armchair travelers find on-line knowledge, friendship — even love.

The social aspects of networks appeal to many personal computer owners, and, if the success of CompuServe's CB service is a valid indicator, modems may replace matchmakers. Terry Biener, a Long Island housewife who writes an on-line column for CB talk service, says "there are an awful lot of people looking for romance." Biener, whose "handle" is Cupcake, adds that CB attracts a mixed group including children and the elderly. On-line friendships, says Biener, can be broader than the more clannish in-person variety.

**Meeting face-to-face**

"There is no way, as a suburban housewife, that I could have met people from all walks of life that I've met on CB," she says. When most of us meet someone in person we go through all sorts of superficial judgments — what they look like, what their voices sound like — before deciding whether we like them or not. On line, there can be an immediate meeting of the minds. You can drop the personal defenses and the superficial judgments and meet the real person."

Biener reports that the first CB baby is about to be born, the happy result of a meeting of the minds of a Columbus, Ohio, couple who met on line before meeting — and marrying — in person. In another on-line romance, Chrisdos, the systems operator for the CB special interest group, met Zebra III, a Chicago zoo keeper whose handle reflects her job. One thing led to another, they met in person and decided to marry.

Biener, who monitors the system carefully so she'll be "in the know" for her on-line column, says it's heartwarming to watch the electronic unfolding of new love. "There's an open channel and a private channel. You'll see that he's twenty-seven and she's twenty-four. One will ask the other to go to a private talk mode — and all of a sudden you'll see the same two people on private talk night after night. Then they might start telephoning and later meet."

Meeting in person is something that most CBers eventually want to do, and CB parties have been a popular way to bring old friends together. Last spring Biener issued an open channel invitation to her Long Island CB party and had 35 on-line friends show up from as far away as Florida. She's been to several CB parties around the country and says that, after the initial lookover, it's like being with a group of old friends. "You do get a physical image of the person on line," explains Biener, "and most of the time it's wrong. You might imagine someone blonde and plump and she turns out to be thin and dark. I'm from New York so I also image their words as having an Eastern accent, and of course they usually don't."


Melanie Palmer

## ON-LINE VOWS UNITE TEXAS COUPLE

It was a wedding to gladden parents' hearts: No awkward rehearsal dinner to chat through, no worries about where to house the guests, and no heated debates about who to invite to the reception. The bride and groom were happy, too, because dozens of friends from all over the country were able to attend.

Cupcake and Jasmine were there from New York, as was Zipp, who brought the rice, and Gandolf, who ushered. Starforce came from Atlanta and Emily dropped in from Cincinnati. Spanky, Chrisdos and Deep Diver made up the Chicago contingent, T.J. Hooker represented Minneapolis, and the caterer came from Boston. Guests at the on-line wedding of George ("Mike") Stickles and Debbie ("Silver") Fuhrman agreed that it was the social event of the CB season.

The couple, who met on CompuServe's CB Simulator, repeated their vows last Valentine's Day from a terminal in Grand Prairie, Texas. The ceremony was performed by an on-call, on-line minister who sat at a terminal in an adjoining room, as the bride's parents witnessed the ceremony from Phoenix. Held at 9 p.m. Central Standard Time so that all invited guests could attend, the wedding was transmitted on scrambled CB Channel 14. Like traditional weddings, the reception lasted much longer than the actual ceremony. The official hardcopy transcript, captured and uploaded by their CB friend Challenger, shows a half-page ceremony followed by a three page reception.

Following a lengthy on-line kiss, which looked like this: [[[[[[[[[ KISS ]]]]]]]]], the reception was kicked off with a picture ⟨⟨⟨flash⟩⟩⟩ from the on-line photographer, Scoop. After the first big flash, congratulatory messages flew fast and furiously. From the 34 Kid came a hearty, "Mazel tov," as Berserker rose and Jasmine wiped her eyes. Margarita lived up to her CB handle and tipped her glass to the newlyweds, as Farquor the organist led all present in the bridal chorus. Zipp sniffed twice as the caterer announced that the tables were set up and food was waiting. Jasmine threw rice * * * * * * * * * * * * * * * and the bride's parents offered their congratulations from Phoenix. Chrisdos, the CB Special Interest Group system operator, ordered 8" x 10" glossies from the photographer.

Amid the excited chatter, a message from Blip summed up the feelings of LooLoo, Captain Kirk, Honey, Star Ease, the Wiz of Kesmai and all the other guests. "A gift to the newlyweds," he said via CB, "our friendship and support." On-line or off, no tinsel-wrapped present could have meant as much.

*— G.H.G.*

Because the ice has long been broken, CBers get down immediately to having a good time at their parties. And to make sure that no one misses out on the fun, every party is logged on to CompuServe. Throughout the evening, those present in body log on to tell those present in spirit what's happening. "It's sort of like a class reunion," says Biener. "I've made on-line friendships, even with the people I haven't met in person, that are more precious to me than any friendships I've ever had."

In their book, *Computer-Mediated Communication Systems*, sociologists Elaine Kerr and Starr Roxanne Hiltz hypothesize that on-line friendships may last longer and terminate because of changing interests rather than because a friend moved out of town. Networks can, as in the case of Hiltz and Kerr, resolidify and enrich old friendships. And with sex, race and physical appearance eliminated as factors impinging on interaction, as they almost always do in face-to-face meetings, people can form friendships for all the right reasons.

Greg Miller

**Sociologist Elaine Kerr: "I'm very high on the personal freedom that being on line offers."**

### Network 'flaming'

But what about the people who don't want to form on-line personal or working relationships for the right reasons? No one claims that the loosely-knit clan of the network nation is superior to the rest of the world. Networks do have a few screamers, a sprinkling of nerds, a deviant or two. Who they are and why they do it has been the subject of some interesting research at Carnegie-Mellon University. A 1982 study headed by social psychologist Sara Kiesler examined "flaming" — unseemly outbursts. As reported in "Psychology Today," her study found that three on-line groups of students, given a hypothetical problem to solve, swore, called names, and were generally abusive. This type of behavior never occurred when the students met in person. Sociologist Lee Sproull, also at Carnegie-Mellon, asserts that the computer culture is in its adolescence and many of its users aren't much older. She has been quoted as saying that the computing subculture is more unruly than the culture that surrounds it.

Elaine Kerr, on the other hand, believes that flaming happens, at least on the EIES system, far more in person or on the phone than on line. "There's no pressure to answer immediately as there is with other mediums," she explains. "If I get a message on line that upsets me — and this does happen because I'm involved in so many things — if I'm smart I don't respond right away. I'll mull over, ponder it, cool off for a while. If it happened face-to-face I'd be more likely to flare up about it."

Because the average EIES user is a professional with a graduate degree, the incidence of flaming is rather low. If a nasty exchange does occur, says Kerr, it's up to the conference moderator who controls group sessions to take care of it. Still, it happens even on the best of systems. "Shortly after EIES went public, we did have somebody on line sending threatening and nasty comments. This is in violation of Federal Communications Commission Regulations — he was warned several times and then thrown off." Like EIES, most networks are upset about flaming and will take away users' privileges to effectively "unplug" abusers. Clearly, the maturity and social skills of networkers play a major role in the extent of on-line adolescent behavior.

Among well-mannered users, surprisingly little misunderstanding occurs. Exclamation marks substitute for jumping up and down, and typed moans, groans, ughs and waaahs substitute for what would pass for nonverbal communication in face-to-face encounters. Tee-hees are popular, as are bahs, and just kiddings. Once users get to know one another on-line, the facetious reply is rarely mistaken among on-line friends for a snotty answer.

### Ages of communications

Fitting computer-mediated communications into its tiny, new niche on the continuum of human communications is a fascinating topic addressed by futurist Edward Cornish. In a famous

essay titled "The Coming of An Information Society," he asserts that computers have been around for — literally — ages. The first were developed by Mother Nature hundreds of millions of years ago. Her technological miracle was, of course, the human brain — a remarkable protoplasmic "wet computer" equipped with oral communicating and computing abilities that made man dominant on earth.

Only 10,000 years later, a mere second on the clock of infinity, humans learned to store information outside the brain and access it in the future in its exact form. Another wonder had occurred — writing — which enabled permanent records, the first databases, to be perused at the reader's convenience. Cornish points out that in succeeding centuries, stupendous efforts were made to speed up the interchange of the written word. Messengers on horse and foot gave their best, often with little regard for comfort or safety. But until the arrival of the telegraph in the mid-nineteenth century, little progress was made: The famous American Pony Express took nearly as long as a messenger relay system used by the Incas four centuries before.

Relatively speaking, the communications breakthroughs that occurred after the telegraph happened at lightning speed. Morse, Marconi, Bell, and all the others whose inventions augmented the communications capabilities of nature's original "wet computer," would be astonished at the current state of communications technology. The complexity of the hardware that will fit on a fixed-size chip doubles every year. Chip storage quadruples every two to three years. The packing density for magnetic disks used for mass storage triples every five years. And prices continue to fall.

Computer networks offering information, entertainment, career opportunities and friendship may soon make terminals essential household tools. In the future, being equipped with a simple old "wet computer" won't be enough. True, wet computers travel well, are handy and will probably never become obsolete. But the technology linking travelers in the network nation offers an access to freedom and knowledge that even Mother Nature never dreamed possible. 💻

*Carole Houze Gerber is a contributing editor to TODAY.*

# ELAINE KERR: Living The On-line Life

In the lives of most nine-to-fivers, freedom is something that occurs after work and on weekends. To Elaine Kerr, sociologist, author and free-lance researcher on the Electronic Information and Exchange System (EIES), it's part of her everyday routine.

"I thrive on wearing jeans to work or checking on the system as soon as I get up," says Kerr. "I'm very high on the personal freedom that being on-line offers. When I was working at regular jobs, there were many occasions where I'd have to show up at a certain time, wearing certain kinds of clothes and look busy even if I wasn't. Now I can take breaks when I want, run errands during the day if needed and work late at night. I do very well in this kind of structure, but some people wouldn't."

Kerr has had a full-time on-line career since 1977 when she worked on EIES helping to organize the White House Conference on Library and Information Services. Other free-lance assignments for business and nonprofit groups followed, as well as research grants from the National Science Foundation and other prestigious organizations. Kerr has worked on-line with colleagues to produce books, papers, and reports. She thoroughly enjoys the opportunity to develop and nurture on-line personal and professional relationships.

"One of the things I like most is being able to share interests with others regardless of their locations. There's only one person in town who shares even a peripheral interest in my research specialties, so having access through EIES to people with similar career interests is marvelous," she explains. Kerr adds that 90 percent of her work interaction, is conducted via computer. "Some of my best friends happen to be on line!"

Kerr, who has taught at Ohio State University and City College of New York, is a friendly, outgoing person and admits that she sometimes misses being with people in person instead of on line. "Sometimes I do miss the socializing and coffee breaks that are part of a normal office working environment," she says. "Because, yes, sometimes working this way *is* lonely. The tradeoff, however, is well worth it. My work literally spills over into the rest of my life. Here I am now, for instance, with my newspaper on my lap for when the network is slow, the dog sleeping on the couch just a few feet away, and my son about to come home from school to me rather than a babysitter. To me, this is a far saner way of living than I've ever had before."

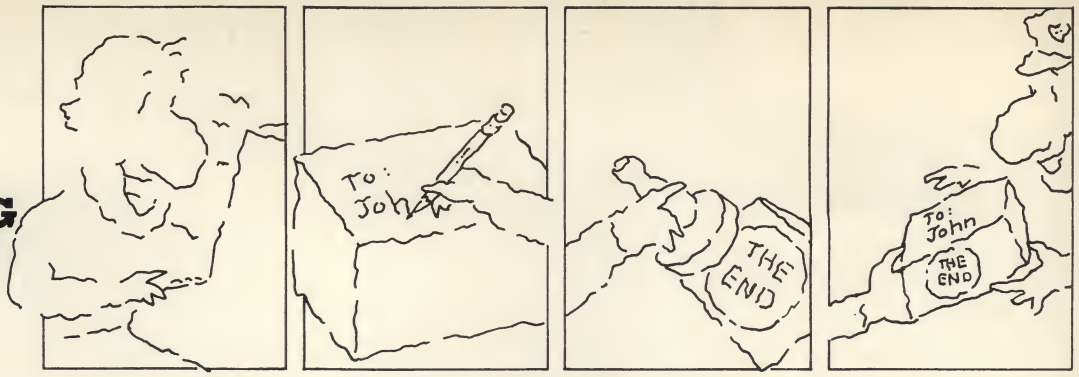
Kerr's career doesn't completely isolate her, of course, nor would she want it to. She thrives on meetings where she meets her on-line friends, some of whom she's known for years before seeing them in person. She also finds that new clients usually prefer to lay eyes on her before sealing a deal. "Most of the time, because of archaic concerns and values, they want to meet me face-to-face," she says ruefully. "But that's just human nature and I can understand their need to look me over." She has had a few clients, though, that were strictly on line — no phone calls, no meetings, no letters. All communication took place on the system, from the preliminary stages to sending the report to the final billing.

Kerr believes that more and more people will sign on to her workstyle as the appeal of computer communications grows. It's a non-intrusive medium, she points out, unlike a ringing phone or a colleague knocking on the door and disrupting one's concentration. The only thing she really misses, she says, is teaching. And that will be solved this fall when she will begin teaching a class for professional women in the workforce. There will be no searching for a faculty parking spot, though, or standing behind a lectern. Kerr will teach the course — surrounded by all the comforts of home — on line.

— *G.H.G.*

# UNDERSTANDING HOW NETWORKS OPERATE

by G. Berton Latamore




Database composes message into packets ☐ Packet is "addressed" ☐ "Sealed" to indicate end ☐ Sent

The packet network system, the computer user's window on the world, is experiencing several simultaneous, rapid changes designed to make it and the thousands of public databases it reaches worldwide more accessible to home and professional users.

Intelligent networks, microwave and cable local connections to databases, satellite networking and virtual circuits, are carrying forward a communications revolution that started two decades ago with Dr. Lawrence Roberts and the Department of Defense's ARPAnet. Today the same interlocking system of networks that links the local user with CompuServe reaches thousands of other databases in 35 or more countries. It works with such efficiency and maintains such purity of data transmission that the user is not conscious of the distances involved. The database could be next door or across the world, but the user receives his data with the same apparent minimal time lag and minimal line noise and without garbling. Furthermore, the network is so economical that cost to the user is much less than that of a direct telephone call. Finally, it is a universal translator between computer formats. Any computer that can access the network can communicate with any other computer on it, even if the two machines are incompatible.

These qualities make the packet network system a basic computer communications utility. Combined with the general distribution of microcomputers thoughout home and office, it offers the potential of turning Alvin Toffler's vision of the electronic village — whose members are defined by common interest rather than geography — into a reality. Tomorrow's company may employ individuals scattered across the country or the globe, working in small offices or at home, many of whom meet seldom, if ever. They will work together using computers and the packet network system. Indeed, such businesses already exist.

**Making the good better**

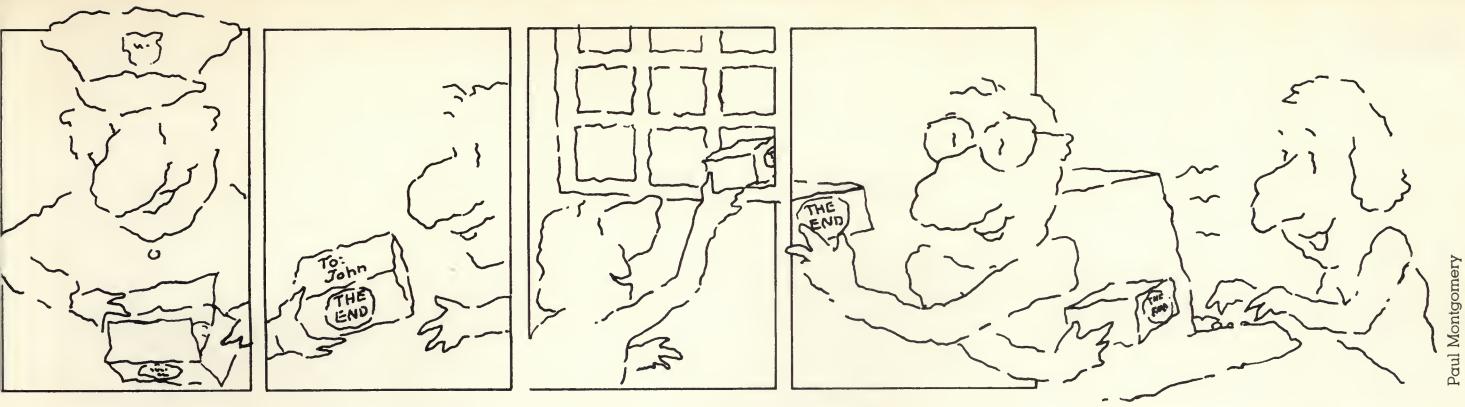
In spite of its virtues, the system is far from perfect. As a result, it is experiencing a series of major refinements, some highly visible, others hidden, designed to make it more efficient and accessable to the computerized public. The first of these is the virtual circuit, pioneered by the CompuServe network and independently by Tymnet.

To understand what virtual circuit does, one must first be familiar with the basic design concepts of packet switching. This was originally designed by Dr. Lawrence Roberts as a way of both increasing data transmission quality and decreasing transmission costs by computerizing the lines on which the data flowed.

To reach an end-to-end packet-switched database, a user dials a local number which connects him to a network node. This is a minicomputer which is connected to thousands of other nodes nationwide by dedicated data-grade telephone lines. A data-grade line is one of high enough quality to handle computer data. This is higher than voice-grade lines, which are the lowest quality acceptable for voice transmission and which are often characterized by a high level of line noise. When the user sends a stream of data to the database, the node intercepts and divides the data into packets of convenient size. On most networks these are always a standard number of bytes or characters with blank characters filling short packets. These packets, which may be thought of as electronic letters, are addressed to indicate their final destination, sealed with a special character to indicate the packet's end, and sent to the next node. The node opens and checks the packet to ensure it was not garbled in transmission, then reseals it and passes it on until the packets finally reach the node serving the database for which they are destined. The packets are sorted into correct order, opened and checked and rebuilt as the original message which is delivered to the database.

One of the reasons Dr. Lawrence developed the packet idea was to eliminate the garbling and line noise problems that often plagued long-range communications over dedicated lines. If a node senses that a packet has been lost or damaged, it can order the sending node to repeat the packet. The node automatically filters out most data transmission problems. The nodes are also programmed to translate computer data into a standard format on receipt. This standard, named X.25 (or X.75, an X.25 derivative), is universal to all packet networks worldwide. It allows any computer on the system to communicate with any other computer. The standard also allows networks to pass data between themselves, making it possible for the U.S. networks, for instance, to connect with the Canadian, European and Asian networks. The standard allows a user anywhere in the international system to reach a database anywhere else in the system, creating the means for a true international communications society not bound by distance or even different time zones.

Of course, many computers and terminals use any large network at a given moment. These transmissions characteristically enter the system at slower than the maximum possible line transmission speed. This is particularly true when the data is being generated by a human operator on a terminal or microcomputer. But even the fastest computer needs time to analyze a request and develop the desired information. Once the data is packetized this speed difference shows up as pauses between packet transmissions which can be used by packets from other data streams. Dr. Roberts took advantage of this to allow his packet network to timeshare on the lines. This is a radical departure from the telephone network system in which one user calls another and establishes a temporary dedicated line (physical circuit switching). As the cost of line bandwidth (the measure of the carrying ability of communications lines) increased steadily through the




to next node that opens and checks ☐ Passed to next node ☐ Node sorts and organizes packets ☐ Message reassembled and sent to database.

last three decades and the cost of computer power dropped at an even faster rate, a situation was created in which the packet concept became more economical than dedicated lines, or physical switching, because it allows a number of users to share the cost of each line.

**Virtual circuits**

The original packet network was ARPAnet, built by Dr. Roberts for the Department of Defense both as an experiment in advanced communications and as a means of linking computers in several universities working on other DOD research projects. It was so successful that it is still functioning today and has been expanded to reach many research centers. A public user portion grew up and was eventually sold to GTE to become the basis of Telenet, one of the two U.S. common carrier packet networks and the second largest in the world. Tymnet, of San Jose, Calif., the other U.S. common carrier, is the world's largest.

Under the original ARPAnet design, each data packet was given a complete address and was free to travel a different route from sender to receiver. As ARPAnet grew from an original single node to a larger, multi-node system, the number of paths available to a typical packet grew to several hundred. Each packet followed the path of least resistance at that moment, the path that first offered an opening for it or the one with the least traffic. Some researchers became concerned that packets might become lost in the network, going around in endless loops and never arriving. While these fears proved groundless, the original packet switch model did have one major drawback. It required full addressing of each packet, and these addresses increased the total data load in the network at a given time by a significant amount. In addition, the necessity of sorting packets at the destination end imposed a large computational burden on the network's computers.

Virtual circuits were developed to decrease this load. In a virtual circuit system, the network creates a single path for all the packets of a particular data transmission. Only the first packet carries a full address, the others are simply identified as belonging to the same transmission and numbered to indicate proper order in that transmission. This cuts the amount of data in each transmission, economizing on network capacity. The virtual circuit, however, is not a dedicated line. The actual transmission facilities are shared by several circuits at a time. This method does have one negative aspect. In the original ARPAnet design, if a line were cut by auto accident, lightning strike or other physical damage the network would instantly adjust by rerouting packets over alternative lines and retransmitting any lost packets. The user generally would not be conscious of what had happened. If a similar accident happens to a virtual circuit network, any circuits using that line are destroyed and must be reestablished. Transmissions can be lost and often have to be resent, and a user may even have to log on over again. However, automatic sorting of virtual circuits has been implemented in some networks, largely eliminating this drawback.

The increase in efficiency with virtual circuits is such that today ARPAnet is practically the only large packet network that does not use them. Tymnet was built as a virtual circuit network as was the CompuServe network, while Telenet, which started with the ARPAnet plan, was recently converted.

**Expansion**

One of the most important network changes is the massive expansion of the entire system worldwide. Not only are new networks appearing from time to time in various nations, but existing packet networks are expanding rapidly. This is especially true in the United States, which has the unique situation of being served by several competing, privately-owned networks with a third being developed by American Telephone and Telegraph.

Unlike local network schemes, the packets are not limited in size, distance covered, configuration or complexity by inherent design. A packet network can be as small as one node, covering a single building or small industrial complex, or it can be international with nodes both on the ground and in orbit reaching across continents and oceans. Tymnet has more than 1,000 nodes and this year will expand its reach into 150 extra U.S. cities. By year's end it will offer local call service to more than 400 U.S. urban centers. Telenet has grown at a rate of 50 to 100 percent a year since it was split off from ARPAnet, and network officials expect to maintain this growth rate for the foreseeable future. Presently it reaches 250 cities with multiple nodes in many of these.

CompuServe's network has 330 nodes and by year's end will reach 300 cities. Unlike the larger public networks, CompuServe's network includes public gateways from both Tymnet and Telenet, effectively increasing its coverage to include the span of all three networks.

This rapid expansion is a response to the spread of computer power nationwide. It is a kind of race with the networks trying to keep up with the growth of demand. At present expansion rates, the day when 90 percent of the U.S. population is within local telephone range of at least one network node is in the foreseeable future.

**The last mile**

Wide coverage may not be good enough. One of the less visible network developments involves replacement of local telephone connections for large volumn users such as databases that require dedicated lines to their entry node. Dedicated phone lines, the normal connection, are hard to get and it can take two years to get one installed. The networks are also concerned that the cost of dedicated phone lines will rise dramatically because of the reorganization of AT&T.

As part of this major rearrangement of the U.S. telephone industry, the Bell operating groups are being separated from their AT&T parent. For years the toll proceeds generated by AT&T's Longlines Division, which the parent will retain, have been used to subsidize local operations. With the reorganization, this will stop. The cost of local service is expected to rise and the cost of long distance calls to fall.

Both Tymnet and Telenet have experimented successfully with microwave and cable connections. Microwave is particularly easy to set up. The connection transceiver is portable, and the antenna can be pointed out a window and aimed at the network node's antenna. Several clients can share a node and a single wavelength. The experiments have proven successful enough that both common-carrier networks have filed for licenses from the Federal Communications Commission to use microwave frequencies permanently.

Microwaves have limits, however. Connections must be on line-of-sight, for instance. This can create problems in cities with many tall skyscrapers. The other alternative under active study is the use of extra bandwidth on two-way television cable systems. Interactive systems which will support home videotex and other electronic communications services are being built in increasing numbers. Cable operators, who traditionally focused entirely on the home market, are becoming conscious of business applications such as those offered by packet networking. Tymnet and Manhattan Cable conducted a successful year-long technical trial in New York City last year. Telenet is involved in a similar experiment. However, Peter Wall, vice president for network engineering at Telenet, said both the cable companies and networks need to develop a better understanding of each other's needs before they can begin to work closely together.

In 1981, CompuServe and Warner Qube conducted a successful experiment to connect terminals in user's homes and offices to the CompuServe network via the Qube cable system in Columbus, Ohio, totally by-passing the local telephone loop.

The packet networks have also experimented with satellite and long range microwave connections as alternatives to long distance telephone lines. However, telephone lines have proved satisfactory, and with line usage costs expected to freeze or drop, the networks have little reason to move off them, Wall said.

## The most spectacular change in packet networking is the intelligent network.

**Intelligent networks**

The most spectacular change in packet networking is the intelligent network, introduced two years ago by CompuServe. CompuServe's Executive Vice President and Chief Technical Officer Alexander B. Trevor designed an architecture for the CompuServe network that would allow users to be transported transparently to databases residing on other remotely located host computers.

For example, by simply choosing a particular menu item, a CompuServe user can be connected to the Official Airline Guide in Chicago or First Tennessee bank in Knoxville, and silently brought back to the primary system in Columbus. All this is accomplished by building a new virtual circuit from the user-adjacent node directly to the desired host computer anywhere on the CompuServe network.

Instead of subscribing to individual databases, the intelligent network user subscribes directly to the network. He receives one bill each month covering his total usage of all databases of this network. This removes the first major block to use of a database: The necessity of subscribing and waiting for the paperwork to be processed.

A travel agent, for instance, might want to reach databases from airlines, hotels and ticket outlets to arrange a client's trip. Using an intelligent network, he only has to make one call and remember one log on sequence and user number. The intelligent network also allows subscribers to access databases they only need occasionally and would not subscribe to individually.

By eliminating complex log on procedures, it makes it easier for users without programming skills to use databases. It is, as Colin Wright, spokesman for the Canadian iNet® program makes clear, designed for the growing market of professional managers.

"It shows you what is available and takes you there," he said. "The information providers are becoming very interested in iNet; they are realizing they can support the casual user through it. Some of them originally said this market did not exist, but they are discovering that it does."

INet, based in Ottawa, is finishing a successful year-long technical trial involving more than 350 public databases and a number of private ones available only to members of special interest groups. Its subscribership grew from 90 to more than 400 during

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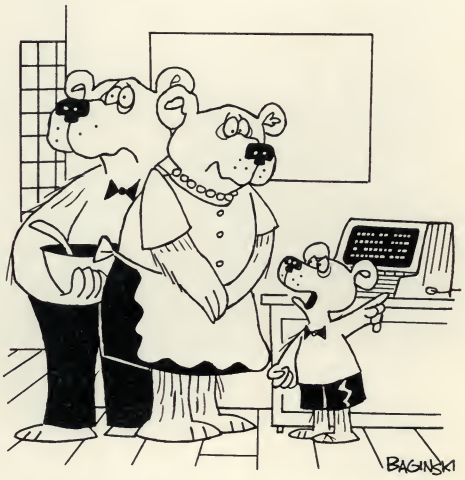
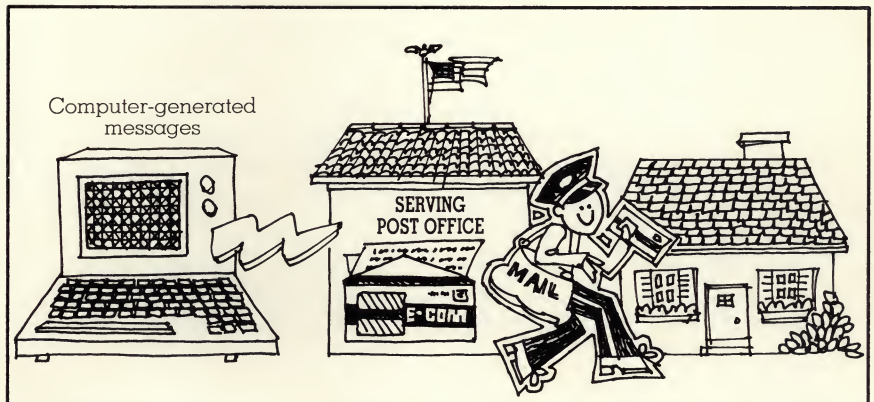



"NOT ONLY DID SHE EAT OUR PORRIDGE, BUT SHE WIPED THE DATA FROM MY DISK FILE!"

# SPEEDY INFORMATION: Electronic Messaging and Computer-Originated Mail

by Carole Houze Gerber




**HOW E-COM WORKS**

David King

The rules of telephone tag are simple. A calls B who is on another line. A leaves a message for B to return the call. This makes B "it." When B calls back, A is in a meeting and can't take the call. It's now A's turn to be "it." In high-level telephone tag, secretaries act as proxies by placing and receiving all calls, thus adding more players and excitement. A really good game of telephone tag can involve half a dozen people and last for days.

It's a frustrating game, however, and an expensive one as well. According to a study reported in *Business Communications Review*, due to busy signals, no answer and equipment failures, only 68 percent of long distance calls and 70 percent of local calls are completed. Of the completed calls, the report says, the called party is reached only 35 percent of the time. A study by the National Aeronautical and Space Administration declares succinctly: "The telephone is a dreary drain on executives' time."

### Electronic mail markets

The combined cost of fruitless long distance calls and wasted hours has convinced many business owners that electronic messaging systems offer substantial savings in time and money. A 1982 industry research report compiled by The Yankee Group, a Boston-based market research firm, predicts a 100 percent market growth between 1982 and 1984 followed by a 50 percent increase each year through 1986.

Presently, there are more than 76,000 electronic mailboxes in the country supplied by seven vendors, according to the Yankee Group Report. General Electric holds nearly 40 percent of the market with their Quik-Comm product, followed by Dialcom's 29.5 percent share. Telemail, InfoPlex and OnTyme each hold between 9 and 10 percent of the electronic messaging market, while Comet with 1.3 percent and Unimail, a new service from the United Telecom Computer Group, has captured a tiny 0.2 percent.

The phrase electronic mail is actually a misnomer, because messages aren't actually mailed anywhere. As The Yankee Group Report points out, most electronic mail software packages work by storing the messages generated on the system disk. Addresses tell the system which users may access these documents — the messages users receive aren't copies of the data file, but pointers to it. When they call up their messages, they access the single copy of the document that exists on the system disk. Even when the message is forwarded, another copy of the message isn't created, another pointer is.

According to Daniel Miller, director of the new electronic media program at LINK, a New York City consulting firm, electronic mail should not be considered a mere electronic substitute for traditional mail services. Miller, whose firm released a report in August 1982 which "examined and defines the total electronic mail market," says that electronic mail defines a variety of personal messaging services, both point-to-point and point-to-multipoint, which represent the convergence of computer processing and telecommunications networks.

### 'Soft savings'

The LINK study examined the variety of services that are provided to a potential population of over 15 million devices, in both the office and home. Services studied included switched teleprinters (often called Telex machines); dumb terminals; personal computers with communications capabilities; videotex terminals; executive workstations; communicating word processors; facsimile machines; and voice mail terminals. Miller says the study found that providing electronic mail services is a booming business — revenues exceeded $55 million in 1982. That figure is growing at an annual rate of approximately 30 percent, the LINK study reported. Miller adds that companies using existing electronic mail services have reported significant "soft savings" in reduced long-distance telephone charges and through increased productivity.

"The integration of electronic mail with other remote processing services — such as editing, filing and database access — gives executives a one-stop source of both remote computer power and access to dispersed staff," Miller explains.

But, adds Miller, the initial acceptance is pegged to the convenience features rather than the cost savings per se. "Initial electronic mail offerings grew out of the office automation marketplace," he explains. "As terminals

proliferate in the office, the need will grow for messaging services that can be easily understood by people with no data processing experience."

The Yankee Group's findings substantiate this need. Electronic mail has already come a long way in its short lifetime, according to Yankee consultant Paris Burstyn. "Early systems seemed to be designed for people with every bit of information they wanted to convey at their fingertips — and who never made any typing mistakes," he says. "In most cases, the most recent generation of electronic mail software makes up for some, if not all, of the deficiencies of earlier systems."

Some would say that electronic mail itself is deficient, or at least, limited in what it can do. As one expert pointed out, users can immediately rule out parcel post from consideration as far as electronic mail is concerned. "If you send your aunt a sweater," he admonishes, "she'd better get that sweater rather than an electronic image of it."

But people do use electronic messaging for chatting and real time communications networks such as CompuServe's CB simulator enjoy great popularity.

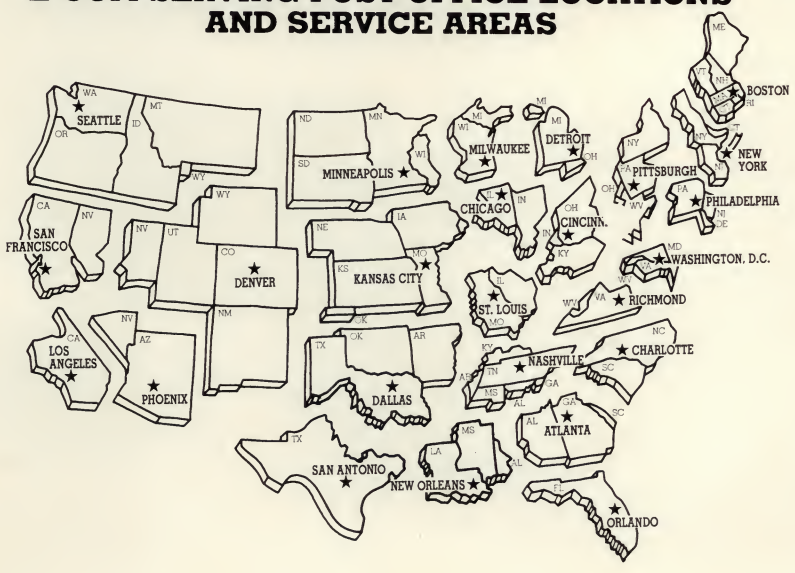
An experiment conducted by the Times Mirror Videotex Service in California, which used 200 Palos Verdes and Mission Viejo families as test cases, showed great acceptance of electronic messaging. Greeting cards elaborately embellished with graphics were particularly popular in the 1982 Gateway test, which also offered home banking and shopping. When the experiment ended and the service was discontinued, many families designed and sent electronic greeting cards to the Times Mirror company thanking the company for the service.

Says LINK's Daniel Miller, "Electronic messaging by home users will probably continue to serve primarily as a method of making transactional services such as banking and shopping more convenient. And although the California test showed that electronic greeting cards were popular, the cost will have to become more competitive with paper cards for that type of service to really take off."

As for business use of electronic messaging, The Yankee Group study predicts in-house software packages will lead customers to electronic mail use. "As more people use in-house systems the need to interconnect them will develop," says The Yankee Group's Paris Burstyn.

According to figures cited in the February 1983 issue of *Psychology Today*, five million computer or data terminals are currently in use in U.S. offices, and that number is expected to increase 25 percent annually for at least the next decade. In terms of individual use, as reported in a study by the Eastern Management Group, about one of every 60 white collar workers has access to a machine. For home users, of course, the figures are much lower. So, although electronic messaging is a popular, growing communications option, the country has a long way to go to become a paperless society.

**E-COM SERVING POST OFFICE LOCATIONS AND SERVICE AREAS**




### Postal service introduces E-COM

For the millions of businesses that need to move paper quickly, the Post Office on January 4, 1983 introduced Electronic Computerized Originated Mail (E-COM). Designed for volume mailers who generate mail from data stored in electronic form, E-COM is not intended to compete with electronic messaging, which requires that receivers have access to a terminal.

Instead, it relieves mailers of the burdensome and expensive tasks of printing, enveloping, stamping and mailing their messages. The charge to mass mailers of 26 cents for a one-page message and 31 cents for two pages is considerably cheaper than the cost of handling the material in-house, according to E-COM Director Karen Uemoto. A subclass of First-Class Mail, the system generally delivers within two days and allows users to enter messages directly to the Postal Service, or indirectly through a carrier acting as the mailer's agent. In the indirect relationship, the carrier transmits messages to the nearest of 25 Serving Post Offices (SPOs) and may provide such services as protocol, format conversion or consolidation of messages from small mailers unable to achieve the required 200 message minimum.

Uemoto, who says the Postal Service does not expect E-COM to operate in the black for at least five years, predicts the system will attract as customers some of the nation's largest mailers. Developed by the Postal Service under a $31.8 million contract with RCA Government Systems Division of Camden, New Jersey, E-COM is presently being fully or experimentally used by financial institutions, insur-

ance companies, airlines, retailers, automobile manufacturers, hospitals and two federal agencies.

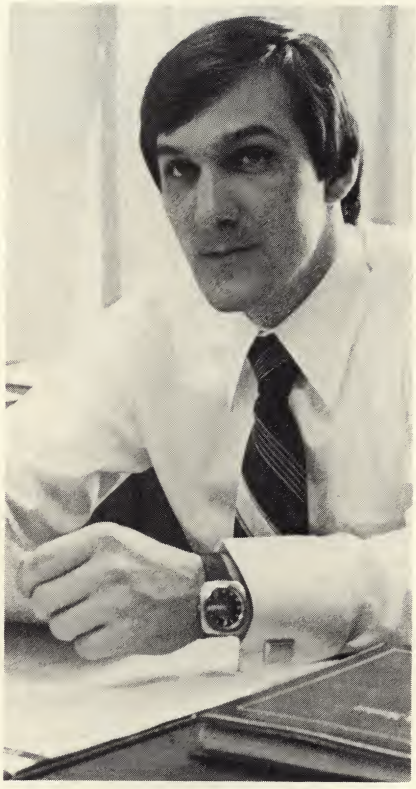
"Many of these firms, particularly banks and retailers, plan to use E-COM to mail statements and bills as soon as inserting capability becomes available," Uemoto reports.

Other options being considered include increasing the number of laser printers (only one is presently in use, in the Detroit SPO) to boost E-COM's printing capacity, and making available to corporate users the inclusion of their logo on E-COM messages.

Presently, E-COM service accepts messages in three formats. These include single address messages, in which a unique text accompanies each address; common text messages, in which a common text is accompanied by a list of addresses; and text insertion messages, wherein a common text is accompanied by both a list of addresses and a unique text to be inserted in each printed message.

An annual fee of $50 is charged to establish an E-COM account and at least 200 messages per transmission must be sent to each SPO being accessed. One way mailers may get around these restrictions is to use a dedicated carrier, such as CompuServe's EMAIL or Business Corporation of America's MAGIC-MAIL, to provide the service. These dedicated carriers, two of a number designated by the Postal Service, provide access to E-COM through their electronic mail and do not place a minimum limit on the number of messages sent by each customer. Instead, letters are stored from various account holders until 200 are available for transmission.

Says CompuServe Vice President Joe Porfeli, who oversees that company's EMAIL service: "With the number of customers on our service, it doesn't take long to accumulate a batch of 200 letters to send to a SPO. Going through CompuServe eliminates the annual fee and the certification process with the Post Office. We have direct access channels to all post offices, and our present charge is about a dollar for just a few pieces of mail. The fee decreases as the number rises. Considering the cost of preparing and sending mail the traditional way, E-COM is a very competitive and time-efficient option."



**CompuServe's Joe Porfeli: "E-COM is a very competitive and time-efficient option."**

According to E-COM Director Karen Uemoto, more than 100 customers are already using the service regularly, and more than 600 firms have applied for certification. One of the largest is the U.S. Department of Housing and Urban Development, which reports saving an estimated $10,500 per year by using the system to deliver mortgage insurance premium notes. The previous method, according to HUD spokesman John Lucian, had cost the Department 40 cents per message. Seventy percent of the cost was for postage, while the rest paid for mailroom labor.

The Air Compressor Group at Ingersoll-Rand, based at Charlotte, N.C., is another E-COM customer. The firm uses the service for sales price announcements, notification of engineering changes, field surveys or product effectiveness and promotional announcements. A spokesperson for the firm says Ingersoll-Rand is also testing E-COM for collections and mailing general account statements.

One of the more vocal supporters of the Postal Service's new system is Barry Rost, a Spring Valley, N.Y., auto dealer. A franchise of World-Wide Volkswagen, which includes 150 Volkswagen Porsche and Audi dealers, Rost is linked through a centralized computer and teleprocessing system to home office computers — which, in turn, are linked to E-COM. As do the other World-Wide dealers, Rost uses E-COM as a part of a total sales program that involves sales calls, direct mail and newspaper advertising. An E-COM letter to customers convinced Rost of the system's worth. The letter, based on computer records of customers' individual service needs, pointed up specials available for the various services.

The response, says Rost, was phenomenonal. "I didn't think it was possible," he recalls, "but we authorized an E-COM mailing which was dropped on a Monday. Tuesday morning, people were coming in the door with the letter in their hands.

"To put together a direct mail piece, print it and distribute it in our former manner would have taken us a month," Rost adds. "It (E-COM) is absolutely the most efficient and least expensive approach to direct mail advertising I have seen."

CompuServe's Joe Porfeli points out — and Uemoto of the Postal service agrees — that E-COM is not necessarily the solution for every mailer. "It's one of a number of options," says Porfeli. "We're in an information age, and any service that can facilitate that flow of information is a welcome addition — be it E-COM, electronic messaging, voice mail or any other of these types of services."

Rob Kling, a professor of computer science at the University of California at Irvine, has written that new technologies are like mass Rorschach tests — people project their faith or distrust in older technologies onto newer ones. As far as the Postal Service is concerned, its performance, from the days of Pony Express to the present computerized system, has established a history of reliability. "E-COM does not replace our other services," Uemoto says emphatically. Instead, it offers another way for us to serve our customers in a cost-effective, efficient manner."

*Carole Houze Gerber is a contributing editor to TODAY.*

# LOCAL AREA NETWORKS:
# A NEW BREED OF NETWORKING

by J. H. Green

We're so enamored with our technology these days that we think of data communications as a relatively new development, though in reality it predated voice communications by more than 30 years. In 1844, when Samuel F. B. Morse keyed the words "What hath God wrought?" the world began communicating by converting text into electrical impulses at one end of a circuit and decoding them at the other. For the first 60 years the coding and decoding were done manually. Then, with the development of the teletypewriter shortly after the turn of the century, machines began to communicate, a trend that has advanced steadily ever since.

A "network" can be loosely defined as a collection of communication paths linking senders and receivers together. Until recently, nearly all networks were long haul or global networks. That is, they were intended to link terminals over relatively long distances. The coding and decoding of data was expensive and neither justified nor necessary for short distances. Now we're finding that the distance for practical machine-to-machine communications is shrinking. With this change the need for a new type of short haul network, the Local Area Network (LAN), is developing.

### Changes in communication

Personnel costs once were relatively low, but computer costs were so high that computers tended to be used only for those labor intensive tasks where machines could replace human labor. Over the past decade the development of the microprocessor has upset the old economic wisdom about justifying the addition of a computer. No longer do we think in terms of replacing people with computers. Now that most accounting operations have been mechanized, we are beginning to use processing power to aid office and professional workers. Computers don't perform the work. Their role in the automated office is to multiply the mental power of office workers by aiding the routine work that diverts people from accomplishing the organization's mission.

For example, electronic mail and messaging are replacing the postal service and office mail. Electronic filing can be used to store documents. Executives increasingly use computers to manage their time through electronic scheduling, calendars and in baskets. Secretaries have been using word processing for years to eliminate repetitious typing and to minimize retyping.

The result of this emerging automation is that the nature of office communication is changing. Communication between machines is changing from batch operations, which are characterized by sending large amounts of data, to interactive processes which convey frequent short messages. Moreover, where in the past executives and professionals rarely touched a machine, in the future they will operate terminals much the same as they operate their own telephones today. As terminals become more common and as people increasingly rely upon them, some means must be provided for economically linking terminals over a limited distance. To this end, a new form of network, the LAN, is gaining popularity for short-haul transactions between data terminals.

### Introduction to the LAN

The nature of office traffic varies with the type of business, but typically, about 80% of communications travel within the local office itself. Even if the office is distributed, as with a campus or multi-building complex, the distance between terminals is likely to be less than a mile.

For the batch processes of the past, point-to-point communications between terminals was warranted, but this is not the nature of traffic within the automated office. When the terminals are interactively linked with each other or with a central data bank, they must be connected many times per day, usually for only a few seconds at a time.

The traditional long haul networks that sufficed for the first 140 years of data communications aren't appropriate for the automated office. For one thing, they are too expensive. Designed for easy access to any other terminal in the world, long haul networks are an overkill — comparable to using a 747 to haul passengers between cities a hundred miles apart. Furthermore, such networks are too slow for the type of traffic offered by the automated office.

The modern office needs a network with these characteristics:

- low cost for short distances, usually less than one mile
- high speed
- easy connectivity to other terminals and external networks
- high reliability
- standard data communications format.

Of the above requirements, the familiar long haul networks can adequately meet only the last two. The world needs a specially designed network to accommodate traffic in the automated office and the multiple terminals of a distributed processing system. This is the domain of the LAN.

Although the need for the LAN is not debated, when it comes to deciding how to design such a network, agreement among the experts quickly evaporates. Roughly three schools of thought dominate.

### The PBX as a LAN

It is logical, given the requirement for interconnecting multiple terminals, to wire each terminal to a line and bring the lines to a central point to switch them together. We have used the PBX for switching voice traffic for years. Its proponents claim that it is one of the most effective ways of interconnecting data terminals. If a PBX already exists in the office, the station wiring is in place and may have enough spare capacity to accommodate the additional load posed by the automated office.

If a PBX is not already in place, conceivably the addition of data traffic to the existing office telephone system

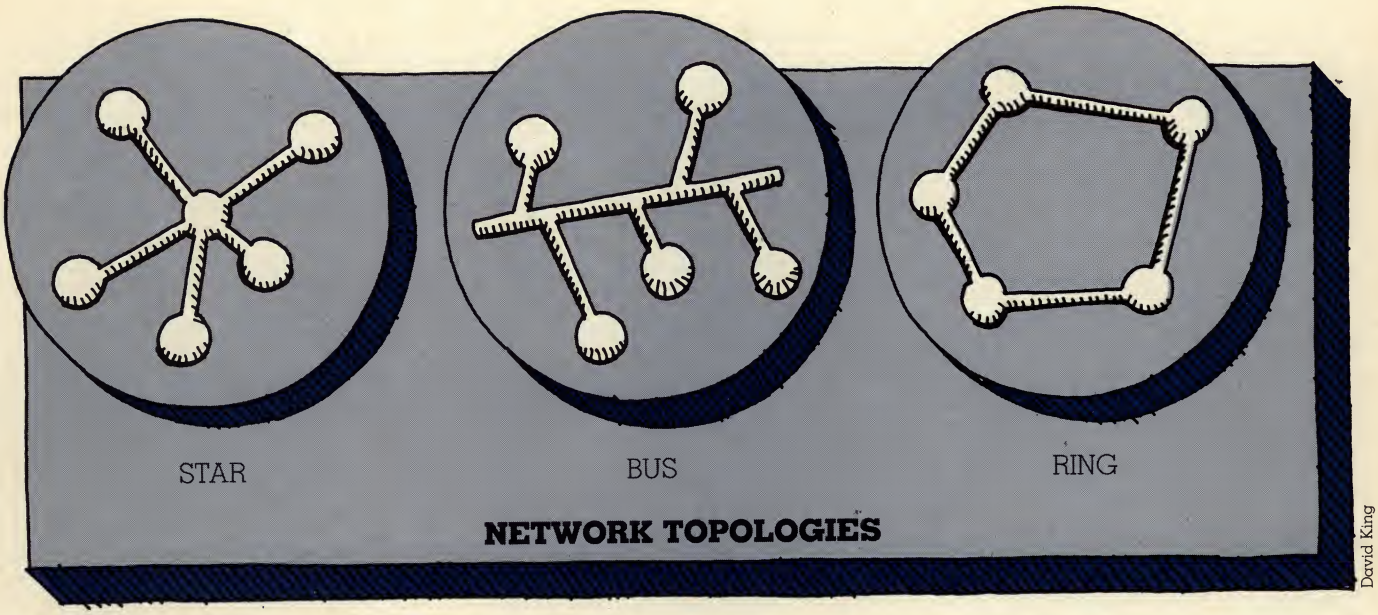



Figure 1

could justify the addition of a PBX. If not, some other form of central switching such as a time shared computer could be used.

But what of our objective of speed? Many of the PBXs in place today use the same technology as long haul networks. Although their designs are optimized for voice traffic, they can impose unacceptable time delays in setting up connections and transferring data. The solution may be in the use of higher speed networks.

**Baseband networks**

Networks such as Xerox's Ethernet pulse data directly onto a coaxial cable. Terminals are bridged to the cable, and when they have data to send, they "acquire" the network and pulse their data at a very high rate of speed. Messages travel in short bursts called "packets" that contain the address of the receiving station. The rate of speed is so high (on Ethernet, 10 million bits per second) that each terminal appears to have a full time connection to other terminals.

Although baseband networks are fast, they are limited to data traffic. All organizations need to transmit voice traffic, and many transmit video as well. Some experts suggest that all office communications be integrated into a single, universal network.

**Broadband networks**

Broadband networks are able to move data, voice and video by use of cable television technology and components. The transmission medium is usually coaxial cable, its capacity divided into frequency bands or channels. Each channel can be multiplexed to carry some form of communication — data, voice or video.

Later in this article, we'll examine these three strategies for implementing a network more closely and understand their strengths and limitations more thoroughly, but first let's discuss some of the terminology used by network designers and vendors.

**Network topology**

The method of connecting terminals together in a network is known as its topology, and is closely related to whether the network is implemented by using switched, baseband, or broadband techniques. Switched networks are inherently configured in the "star" topology shown in Figure 1. With the switch in the center, lines radiate to the terminals. The telephone network and most other switched networks use this topology.

In the "bus" network the terminals are bridged on the transmission medium. Each terminal is assigned an address code, and responds only to messages directed to it. Baseband networks and many broadband networks use this configuration.

With the "ring" topology each station on the network receives messages from the preceding station and passes them along to the next until they reach the addressee. This topology is similar to a bus with the open ends joined, except that the major points or "nodes" usually receive and repeat the message rather than simply responding to messages addressed to them.

**Transmission media**

For years, networks were linked with paired copper wire. However, wire has limitations. At high speed the problem is one of bandwidth, which in audio terms refers to the range of frequencies that can be transmitted. With digital data, characters are coded with square wave voltage pulses: the higher the speed, the shorter the pulse. The electrical characteristics of wire introduces distortion that increases with speed and distance between terminals. At the outer limits, the receiving terminal can no longer distinguish between pulses, and errors occur unless the pulses are electrically regenerated.

A practical solution to the limitations of copper wire is to use coaxial cable for the transmission medium. A coax consists of a single center conductor surrounded by an insulator and a shield. The electrical constants of coax are controlled so it is capable of much greater bandwidth than wire. Currently, most broadband and baseband networks use coax as the transmission medium. However, a new medium, fiber optic cable, is emerging.

A fiber optic system starts with a transmitter which contains a light emitting diode or a laser about the size of a grain of salt. Digital pulses drive the light source on and off, following the zeros and ones of a data signal. The light is pulsed into a thin glass strand that resembles a fishing leader. At the receiving end, which can be up to 10 miles from the source, a photo diode detects the light pulses and con-

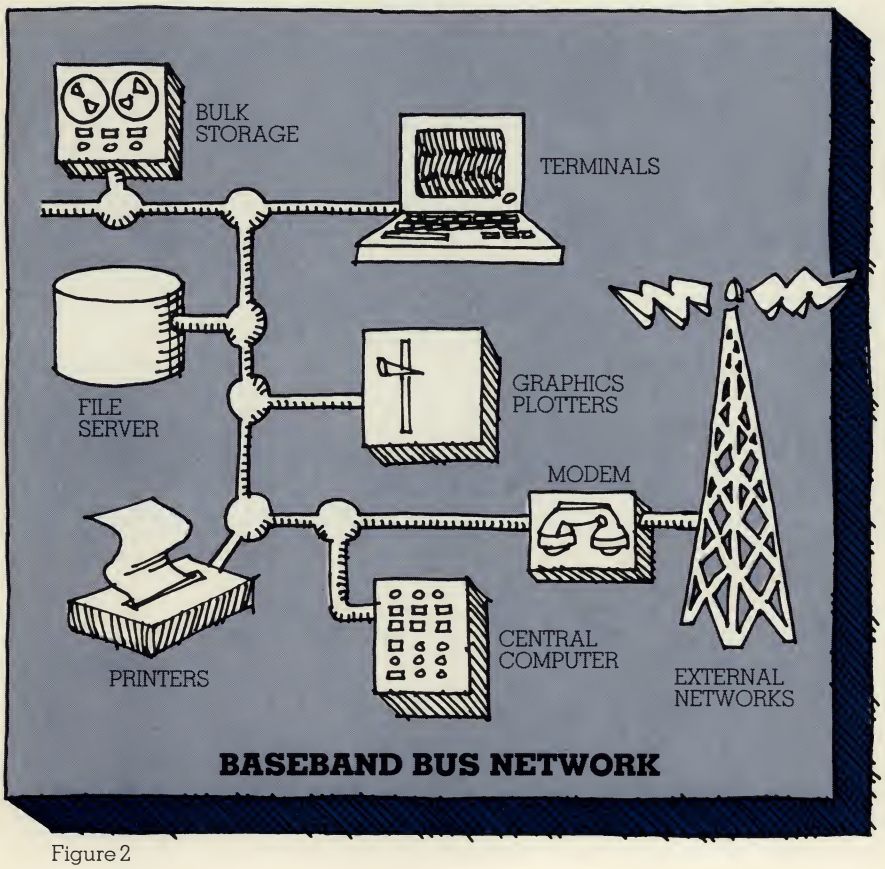



Figure 2

verts them to their original electrical form. Commercially available systems operate at speeds as high as 90 million bits per second, although this is considerably more capacity than most LANs require.

The chief advantages to fiber optics are its bandwidth, its ability to transmit pulses over long distances without amplification, and its immunity to interference. Until recently, glass fibers were unable to compete in cost with coax, but increases in demand and improvements in manufacturing techniques are narrowing the gap. Fiber's greatest drawback for a LAN is the fact the it cannot easily be tapped to connect terminals. By contrast, coax can be tapped with simple hand tools. For this reason, fiber optics is not practical for bus networks. It is usable in a ring network where light pulses are regenerated at each node, but the optical transmitters and receivers are too expensive for short distances.

Development is underway on a "reflective star" in which fibers are brought to a central point where light pulses from any line are reflected back to all lines, thus creating the equivalent of a bus topology. Although fiber is in its infancy, it will predictably become the predominate transmission medium in the future.

**Standards**

Computer and data transmission technology have been hampered from their infancy by the failure of the industry to set standards. The interface between data terminals and modems is standardized, but nearly everything else is designed to some sort of ad hoc standard. For example, many manufacturers produce modems that are compatible with Bell System modems. Many terminals are compatible with IBM terminals. Gradually IBM protocols such as the Synchronous Data Link Control (SDLC) have become de facto standards, although international standards such as X.25 set by the Consultative Committee on International Telephone and Telegraph (CCITT) are becoming common.

The news is somewhat better with LANs, but not much. With PBXs, the network can usually be considered as a wired connection once the terminals have been switched together. Terminal-to-terminal communications will work satisfactorily through most PBXs as long as the terminals and modems are compatible, and the transmission speed does not exceed the bandwidth of the PBX.

With baseband networks, standards are another matter, for none have yet been officially recognized. The Institute of Electrical and Electronic Engineers (IEEE) has appointed a committee known as the 802 Committee to set LAN standards. The committee has completed its recommendations and has published them for comment. In the meantime, no recognized standard for baseband networks exists.

Three companies, Xerox, Intel and Digital Equipment Corporation, have developed the baseband network Ethernet. Ethernet is similar to the standard network being proposed by the 802 Committee, but machines compatible with Ethernet will not automatically be compatible with the IEEE standard LAN.

The saga of Ethernet is representative of the problem of standards in the data communications industry. Becoming the proprietary vendor of a standard offers a significant marketing advantage. Therefore, the standard-setting process may be delayed interminably while competitors debate the merits of alternative methods. This has happened to baseband networks over the past few years.

Broadband networks are subject to the same lack of standards as other nets. However, the problem is not so much a proprietary one because broadband nets may be implemented by using standard components to divide the frequency spectrum of the transmission medium into a large number of channels. Individual data channels are derived using frequency division or time division multiplexers that have been standard in the telephone industry for years.

As long as communications between machines are point-to-point, a baseband network offers the equivalent of directly wired communications. For the rapid and universal access needed by the automated office, some means of switching the terminals together is needed, and here broadband networks must use switching or some form of allocating time to the terminals on the net.

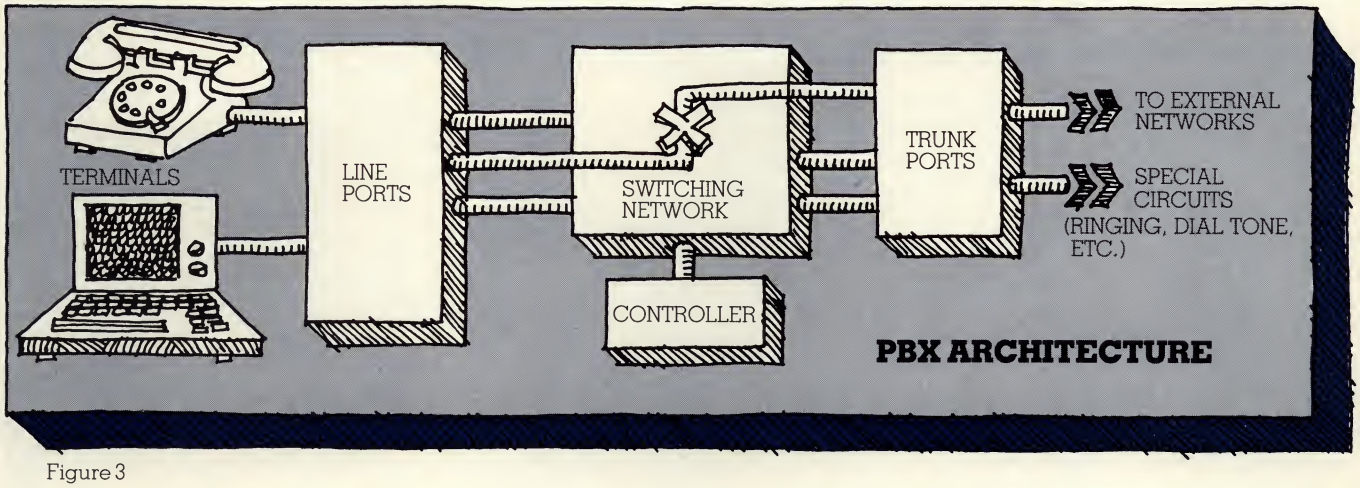



Figure 3

**A guide to baseband networks**

With the terminology just covered, we can now examine methods of implementing the LAN and can understand some of the implications in choosing among the alternatives. The most straight forward is the baseband network, which is illustrated in Figure 2.

One of the greatest advantages to a baseband network is its simplicity. The network contains no active components aside from the terminals. The network is a coaxial cable with terminals tapped on wherever they happen to reside. Electronic failures will affect only one terminal and not the entire network.

Access to the network is accomplished by a transceiver attached to each terminal. Messages are formed into short packets that contain information bits sandwiched between the address of the receiving terminal, error checking bits and other overhead bits. The transceiver "acquires" the network long enough to spill a packet of information forward at a high rate of speed. In Ethernet, for example, the transmission speed is 10 MBS. As the terminals are all bridged on the coax, the message appears simultaneously at all machines, but only the addressee receives the data.

In the world of no free lunch, this simplicity has its price. As there is no means of allocating access to the network, machines inevitably attempt to send messages simultaneously. When this happens, the terminals are said to "collide." Two different strategies for handling collisions are currently recognized; both are included in the proposed IEEE 802 standards.

The simplest system, the one used by Ethernet, is the "contention" system. A common technique is known as Carrier Sense Multiple Access with Collision Detection (CSMA/CD). With CSMA/CD, colliding terminals both drop off the network and reacquire it at a randomly selected time. Collisions are rarely a problem as long as the network is lightly loaded. As the load increases, more of the network's time is used in collision recovery, limiting the practical capacity of the network to considerably less than the theoretical maximum.

To increase the capacity of a bus network, an alternate system used is "token passing." Collisions are eliminated with this system because only the terminal with a software mark that serves as a token can transmit. After a terminal sends its message the token is passed to the next terminal, and so on. Although token passing increases network capacity, the improvement is achieved at an increase in cost and complexity.

**A guide to switched LANs**

Although the PBX is the most common form of switch in the office, it is not the only way of implementing the LAN. Computers equipped with time sharing ports can be programmed as message switches. Specialized data switches are also available on the market. As the concepts are similar, we'll confine our discussion to the PBX.

The most frequent reason for using a PBX to switch data traffic is that it is in place. When PBXs are installed, the cabling to each telephone often includes spare wires that can be used for a data terminal. If spares are not available, a data "carrier" can be used to multiplex data and voice over the same wires. (A carrier is a device that superimposes the data channel on a frequency outside the voice band so the data signal does not interfere with the voice).

Another advantage to the PBX is that it is easy to implement. Data terminals and modems can be connected to line ports as easily as connecting a telephone. The terminal address is assigned as a telephone number, and in some applications, alternate voice and data connections are feasible.

PBXs have three major components, which are shown in Figure 3. The primary function of the PBX is to connect ports together. Ports serve as the interface between the switching network and the ouside world, and come in two varieties. Line ports connect to terminals within the PBX's serving area. Trunk ports interface the PBX to external networks such as the long distance telephone network, satellite circuits, and to special circuits within the PBX such as its dial tone generator.

Connections between ports are directed by the controller. Before the invention of the microprocessor, the controller was an electromechanical device using relays for the logic elements. Later, relays were replaced by solid state logic. Now, virtually all PBXs use processor control.

Switching networks likewise evolved as technology advanced. Relay networks make connections by the physical operation of electromechanical switches. Such networks are called "space division" networks. More recently, "time division" tech-

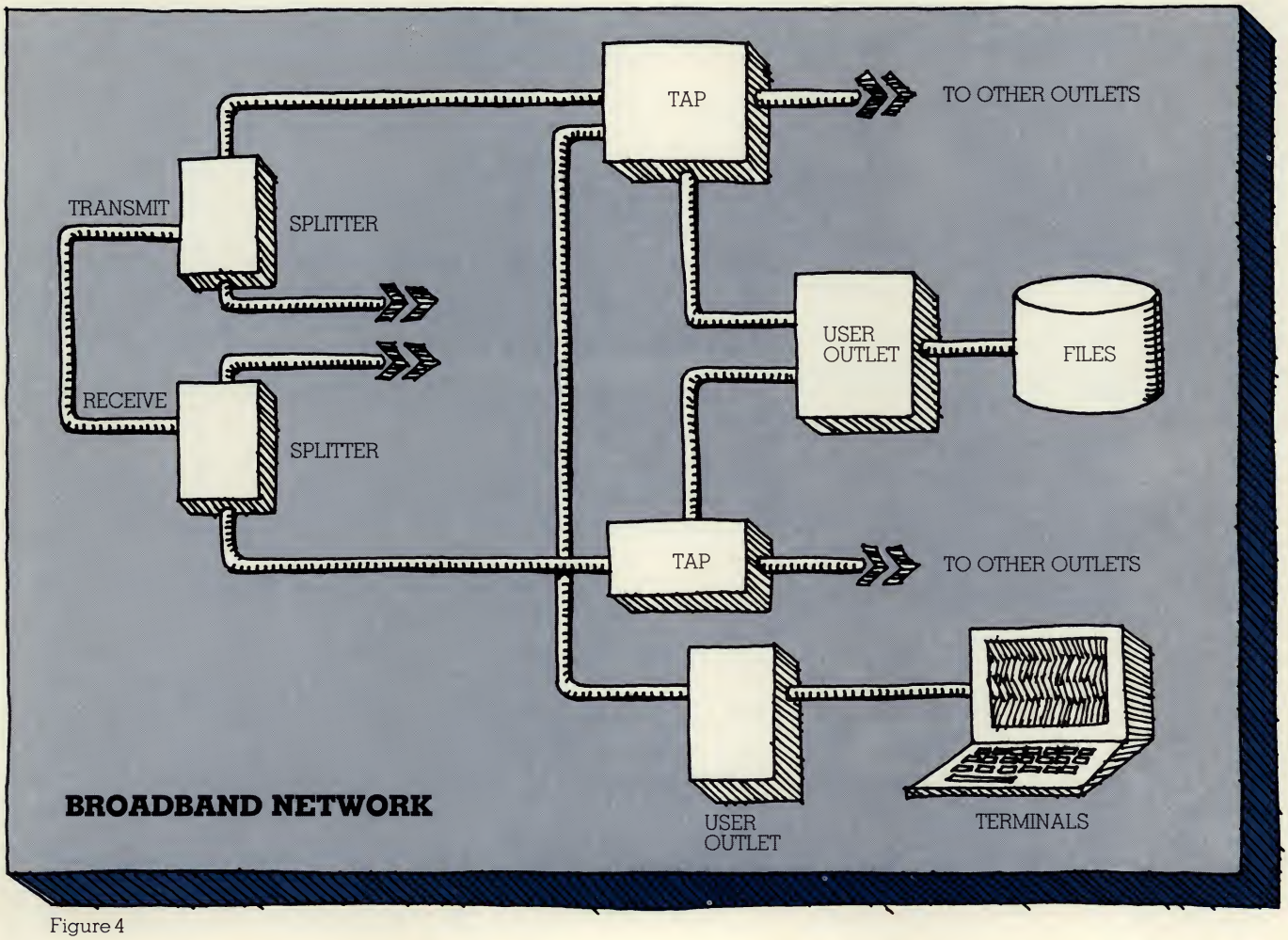



Figure 4

niques have been used in PBXs. In a time division network, the ports are connected to a bus long enough to transmit a sample of the incoming signal to the port. As long as the sampling rate is high enough, the receiving port can reconstruct the original signal from the sample that is transmitted over the bus. The standard sampling rate for North American digital transmission is 8,000 samples per second, which is high enough to reconstruct a 4 KHz signal without any loss of intelligence.

Two types of time division networks are common today. One type uses pulse amplitude modulation (PAM), in which the pulses imposed on the bus are proportional to the amplitude of the original signal. The other system, pulse code modulation (PCM), further processes a PAM pulse, converting it to an eight bit coded word.

In reviewing the use of a PBX for a LAN, it is important to keep the differences between these techniques in mind. First, electromechanical systems are capable of handling high speed data, but their relay operations may generate noise pulses, resulting in data errors. PBXs with time division networks and solid state controllers generate very little noise. However, all PAM PBXs have analog networks that can pass data only if it is first coverted to analog form by a modem. This is also true of PCM PBXs that use line ports that have not been specially designed for digital operation.

Some PBXs of current design can switch data traffic without the use of modems and thus reduce cost. Most PBXs designed for data traffic are capable of passing data at much higher rates of speed than the 2400 baud limitation of most analog PBXs.

A further limitation to the PBX as a LAN is the potential of overload. PBXs are normally designed for voice traffic, which has much different characteristics than data traffic. The considerations in loading a PBX are too complex to be covered here, but when contemplating the use of a PBX as a LAN, you must be aware of the potential of overloading the machine and degrading voice service.

The PBX has other drawbacks which may not be so important, depending on the application. If the machine is already in place and has capacity for data, these drawbacks may not be compelling, but they should nevertheless be considered.

First, all but the newest machines are limited in the speed of data they can handle — usually 2400 baud. Second, even though a programmable terminal can dial a connection to another terminal, the time that it takes may be significant. The most effective local networks appear to the user to of-

fer a full time dedicated connection to the other terminals. Few PBXs operate this rapidly.

### Characteristics of broadband LANs

In the strictest sense of the word, the broadband network is not a LAN, although one of its channels can be used as a LAN. Rather, a broadband network is a means of multiplexing several communications channels on a single transmission medium. Some vendors build broadband techniques directly into their proprietary networks. For example, WangNet uses broadband techniques to multiplex four communications channels over a coaxial cable as shown in Figure 4. The channels are used for connecting Wang systems together, for connecting to Wang peripheral equipment, for interconnecting other vendors' equipment, and for video.

Wideband LANs use cable television technology to subdivide a coax into multiple channels. A coax and its associated amplifiers have a bandwidth as great as 400 MHz. In this bandwidth, one could theoretically transmit 100 television channels or 50,000 two way voice or data channels, a capacity well in excess of the needs of the LAN.

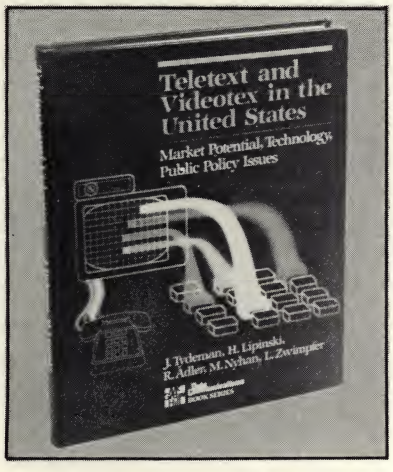
To make use of this capacity, voice and data channels must be multiplexed using digital or analog carrier. These carriers are standard in the telephone industry, but as most are designed for long haul service, they are expensive. Television channels can be derived using standard CATV equipment. The chief advantage of broadband networks is their ability to handle substantial amounts of voice, data and video communications over relatively long distances. Their chief disadvantage is cost.

### Summary

If there is one conclusion to be drawn from this discussion of local area networks, it is that so many alternatives are available that you must thoroughly understand your needs and options before making a selection. There is no universally superior LAN on the market today, nor is there likely to be in the future. Each of the alternatives is superior for certain applications.

Many organizations have not yet discovered a need for a LAN. Perhaps yours is one of them, but unless your office is very small, it is safe to predict that in a few years it will contain a number of terminals and you will need some means of linking them. Whatever form that takes it will likely be some type of LAN.

*J. H. Green is a free-lance writer from Portland, Oregon.*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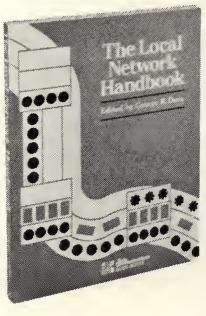


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# NETWORKING WITH WORDSTAR

by Ernest E. Mau

Did you know that a word processor is a valuable networking tool? Word processing outside a network speeds preparation of text for transmission, allows reformatting of received text, and reduces connect time. This translates into savings of both time and charges, making word processing a cost-effective tool for getting the most use from a computer network.

Many word processors and networks are available, but similar considerations affect virtually any combination. The object is to enter the network, transmit or receive data, and exit as quickly as possible. Manually keying or typing text or data into a network can consume hours, while preparing material outside the network and transmitting stored data files might require only minutes on the phone lines.

To show what can be done, this article describes using WordStar with the CompuServe Information Service. WordStar was chosen because of its popularity. It provides interesting possibilities in formatting materials while presenting challenges for effective use. The procedures assume you have communications software capable of either storing a text file in a memory buffer for transmission or reading a file directly from diskette onto the telephone lines.

**Creating and editing document files**

WordStar provides two methods of creating or editing files, namely the "non-document" and "document" modes. These are the "N" and "D" Options from the No-Files menu respectively.

Under Option N, a literal ASCII file is generated on disk, allowing things such as BASIC programs to be coded, edited, and stored. Those same files are suitable for direct transmission to the CompuServe network, provided lines don't exceed the maximum length acceptable to the destination within the network. However, non-document editing does not provide extensive formatting features.

Under Option D, formatting is available, but output files are not completely compatible with network requirements. Those files contain things like "soft carriage returns," invisible tabulation characters (CTRL-I), non-standard characters where bits are changed, and so on. Therefore, a document file must be processed to make it a literal ASCII file properly formatted for network transmission.

Since it's the more complex method, consider document preparation with Option D. Once the document mode has been entered, a format compatible with the network must be established with WordStar's menu functions and "dot commands."

Begin by setting the "O-menu" formatting options. The menu is accessed by typing CTRL-O. Then an option is changed by keying its letter, and this is repeated until all desired options are set.

1. Set the left and right margins at columns 1 and 65. This is WordStar's normal ruler-line default, but some user's change the default. With 65-character lines, the danger of overrunning line-length boundaries of the CompuServe network is eliminated. The right margin can be changed to other lengths like 40 or 80 without problems, but 65 has proven almost ideal. Typing CTRL-O L or CTRL-O R allows changing the left or right margin by answering the prompt with the desired number.
2. Set single spacing using the CTRL-O S option as necessary. Double spacing or other settings may be used if transmitting to the CompuServe Programmer's Area for something like submission to Public Access, but blank lines are eliminated from files transmitted to Special Interest Group (SIG) message boards. In fact, two consecutive blank lines sent to an SIG message board indicates an end of text and terminates the "Leave message" function. Normally, single spacing is the most useful and practical setting.
3. Turn justification off by toggling the CTRL-O J option. Justified text inserts extra spaces that make the file difficult to read when retrieved from the network.
4. It's best to turn hyphenation help off by toggling the CTRL-O H option. This prevents complications in SIG message boards. Those messages are compressed, unlike transmissions to the Programmer's Area and Public Access, so hyphenating words could cause extraneous hyphens in lines when retrieving messages with a system set for a different line length. Similarly, soft hyphens should be switched off by toggling the CTRL-O E option.
5. If off, word wrapping should be switched on by toggling the CTRL-O W option. This simplifies text entry, and later processing eliminates all resulting soft carriage returns.
6. Other O-Menu options may be left in any desired state. That includes tab stops, ruler display, margin release, and so on.

Next, establish the WordStar "dot commands" — formatting instructions embedded in text to control the printed format. Eventually the file will be "printed," but to another disk file instead of a hard-copy printer. That new file will have all formatting commands executed and the data or text properly arranged. The most practical dot-command parameters are as follows:

1. Page length isn't critical, but 66 lines is the standard default. If you like, you can enter a .PL 66 command to override any other defaults.
2. Top and bottom margins should be set to zero, thus avoiding later problems of blank lines being inserted for page breaks and possibly interfering with the data transmission. Therefore, the commands .MT 0 and .MB 0 should be placed in the file. This also eliminates page headings and footings, but it's not necessary to zero those margins with the .HM or .FM commands. The exception is when there is some need to transmit paginated text to something like the Programmer's Area for retrieval though Public Access. Then, full page formatting can be used, complete with margins, headings, footings, page numbering, forced page breaks, and so on.

3. In most cases, there should be no spaces preceding the beginning of formatted lines. Spaces are handled literally in the CompuServe Programmer's Area and, thus, in Public Access files. They override normal compression in SIG message boards, preventing lines from being merged into contiguous paragraphs, so unnecessary leading spaces usually are undesirable. Therefore, a .PO 0 should be entered into the file.

4. It's a good idea to enter a .UJ 0 to switch microjustification off. Microjustification sometimes inserts some extra characters designed to control printer spacing, and those characters should not be included in files for network transmission.

5. In most cases, page numbering is switched off with the .OP command. Top and bottom margins already have been overridden and set to zero, so there's no room for page numbering anyway.

6. While typing the actual document, conditional page and new page commands, .CP and .PA respectively, should not be used because there is no pagination. The remainder of the dot commands aren't critical and can be ignored or allowed to default.

As a result, the initial lines of the file being created would appear as:

```
.PL 66
.MT 0
.MB 0
.PO 0
.UJ 0
.OP
```

Once these parameters are entered, the text is typed more or less normally. Full editing facilities are available, word wrapping is in effect, margins and indents can be adjusted, paragraphs can be formed or reformed as necessary, and so on. For network transmission, there are only a few restrictions dictated by the receiving end.

1. While preparing something for an SIG message board, do not use blank lines between paragraphs because they will be removed. Even a line containing only spaces will be treated as a blank line and removed. However, blank lines are acceptable if the destination is the Programmer's Area or Public Access.

2. Paragraphs may be indented by inserting leading spaces or a tabulation (CTRL-I) in the first line, regardless of the destination. If a tab is used, later processing will assure it becomes a series of spaces.

3. Special printing enhancements are not usable in networking, and they may damage the file being transmitted so it can't be retrieved properly by others. Avoid boldface (CTRL-P B), double-strike (CTRL-P D), underscore (CTRL-P S), overprint (CTRL-P H), strikeout (CTRL-P X), subscript (CTRL-P V), and superscript (CTRL-P T) commands entirely. The results will be unsatisfactory.

4. The non-break space (CTRL-P O) may be used to tie words together so they don't split at the ends of lines — it will be converted to a regular space during later processing. Regular hyphens may be used in compound words and will be retained as hyphens in the final file. Soft hyphens such as those inserted with the hyphenation function of paragraph reforming should not be used. They would become hard hyphens at line endings and possibly be extraneous characters in the final file when retrieved by a computer set for a different line length.

5. Tabulation in the middle of the line may not be feasible. Often this would be used to prepare tabular information. To make the tabs "stick," each line must stand alone without being compressed into a paragraph. Therefore, each line would have to begin with at least one space. However, if the material is retrieved by a computer set for a shorter line length than the original computer, the message would be reformed, one line might be turned into two or more, and the tabulations would be lost.

Once the file is completely typed, save it to disk in the normal way. It then can be processed through spelling proofreaders, grammatical checkers, and similar peripheral programs just like any other document file. When you're satisfied with the file, it's ready for conversion to a form suitable for transmission.

### Reprocessing document files

The document file just created is in a raw form suitable for WordStar but not for network transmission. To finalize or "fix" the file, it's necessary to go through some other simple but important steps.

The first is to "print" the document as a new disk file. From the No-Files menu, enter "P" to print a file. Answer the prompt for Disk File Output with a "Y" to write a new file, and then give a file name different from the document name. Use the defaults for starting and stopping page numbers so the entire document is printed. Answer "N" to the prompts concerning form feeds, suppressing page formatting, and pausing between pages. The result will be a new disk file completely formatted in accordance with the embedded commands in the original.

Now, use the "N" or non-document option from the No-Files menu to perform some final editing passes on the newly created file. Once that file is displayed on screen, you will see individual lines formatted as originally specified.

The new file still contains soft carriage returns that must be eliminated. This can be done with a global search and replace operation. The procedure is to type CTRL-Q A to call for the search. Answer the prompt about what to find with CTRL-N, and answer the prompt about the replacement with another CTRL-N — or CTRL-P CTRL-N in both cases. Then answer the options prompt without requesting verification. As the replacements are made, a backward arrow (←) appears at the right screen edge for each line, showing that the carriage return for that line has been "hardened." To speed the replacement, strike a CTRL-E after the search starts, and screen updating will not be performed until all replacements have been made.

Sometimes, such as when preparing an SIG message, there may be an advantage in adding single spaces at the ends of certain lines. When files are compressed by the CompuServe network, it's possible to lose a double space after a period or one of two hyphens used for an "em dash." By adding an extra space after a period or em dash, those items will be kept intact when text is compressed.

While in the non-document mode, check the character count shown at the top of the screen. If the text or data

contains more characters than will fit in the communication software's buffer or in the destination file, it must be split into more than one part. The easy way is to return to the beginning of the file (CTRL-Q CTRL-R), place a block-beginning marker (CTRL-K B), move forward until the counter indicates a suitable number of characters within the lowest limitation for the buffer or destination, place a block-ending marker (CTRL-K K), and perform a block write (CTRL-K W) to a new file. Then repeat this through the entire document until it has been broken into several files each small enough to transmit without problems.

The material now is ready for transmission. Exit the word processor, activate the communications software, and access the network. Then load and transmit as many files as you have prepared. All the time consuming work has been done outside the network without incurring connection charges, long-distance phone bills, and so on. In a matter of minutes instead of hours, all your information can be sent to the network. Furthermore, you've had the opportunity to clean up the material with spelling proofreaders, careful editing, and other procedures at minimum expense and maximum convenience.

### Processing a received document

Just as word processing can be used to prepare a document or data for transmission to a network, it can be useful in processing and reformatting things retrieved from the network. Notable applications include deletion of message headers and CompuServe prompts captured along with the file, combining separate lines into contiguous paragraphs to save paper when printing, and eliminating stray characters such as line feeds from the captured information.

All that's necessary is to store the captured file on disk. As an ASCII file, it's readable by WordStar in either the document or non-document mode. For normal text, the file is read under Option D of the No-Files menu. Once on screen, a full spectrum of editing and formatting tasks can be performed.

1. Line-by-line deletions (CTRL-Y) or entire block deletions can be used to eliminate headers and stray prompts that aren't needed.
2. Separate lines can be combined into paragraphs by replacing the terminating carriage returns with spaces. Using CTRL-Q A to activate a global search and replace operation. the string to find is CTRL-N, and the replacement is a single space. The option is "G" for global. This replacement should be done with item-by-item verification active to prevent merging paragraphs accidentally. This should be followed with paragraph reforming to the specified margins using the CTRL-B function.
3. Stray characters like backspaces can be eliminated by a global search and replace, specifying CTRL-P CTRL-H as the search string and a null string as the replacement. Stray line feeds can be eliminated by specifying a CTRL-P CTRL-J to be replaced by a null string. The null string is specified by entering a carriage return with no preceding characters in response to the prompt for the replacement.

Once the captured file is formatted to your satisfaction, add whatever printout commands you need, save the revised file to disk, and then print it. You'll have clean, easily readable outputs that waste little paper.

Occasionally, a retrieved file may pose special problems. The usual indication is that under document-mode editing, the right edge of the screen either shows no flag character or a hyphen flag. That means the line does not end in a normal carriage return/line feed sequence, but with some other character combination that doesn't show on the screen. Some trial-and-error tests are needed to determine what line terminators are used and to replace them with acceptable ones. Numerous combinations have been noted on different files, apparently caused by different methods of placing the file into the database or message board combined with the originator's network formatting and terminal options.

Such line terminations must be fixed before any other editing. It's even possible to have a file appear as pages of text but actually be treated as one long line. Thus, doing a CTRL-Y to delete one line from the screen causes WordStar to delete the entire text.

The simplest case usually involves no line flag at all. Sometimes this occurs when the line ends with an invisible CTRL-M CTRL-J that just isn't registering to WordStar or is being seen as a soft carriage return. A global search and replace to find CTRL-P CTRL-N and replace it with CTRL-P CTRL-N often fixes the problem and provides proper backward arrows (‹) as line flags.

Hyphen flags are another matter. They can indicate isolated carriage returns without line feeds, line feeds without returns, tabulations and returns, and so on. Finding the correct combination sometimes is difficult, but persistence usually pays off. To check for an isolated carriage return, use the global search and replace, answering the find prompt with CTRL-P CTRL-M and the replace prompt with CTRL-P CTRL-N. Ignore the carriage return when answering the find prompt — it looks like it's an improper response since the next prompt overlays the first, but it does work. Similarly, finding a CTRL-P CTRL-J and replacing with CTRL-P CTRL-N can eliminate isolated line feeds. Again, disregard the line feed that occurs after the find prompt. It puts the remaining prompts in odd positions, but line feeds will be found and replaced.

Throughout the trials, if a hyphen, question mark, or "]" flag appears at the right edge of the screen, an improper find and replace has been performed. Abort the operation, quit the file without saving, reload it for editing, and try some other combination.

### Summary

All in all, word processing is a useful and attractive feature in combination with networking. This article has dealt with WordStar, but similar procedures can be used with most other processors. Of course, this has only been a guide, and every individual develops specific preferences in formatting. People using only the Programmer's Area of CompuServe might never have to invoke document editing under option D, preferring instead to remain in the non-document mode and preparing data and programs on a line-by-line basis. In that case, the output file already is prepared for transmission and no further changes are necessary.

*Ernest Mau is a technical consultant and freelance writer from Denver*

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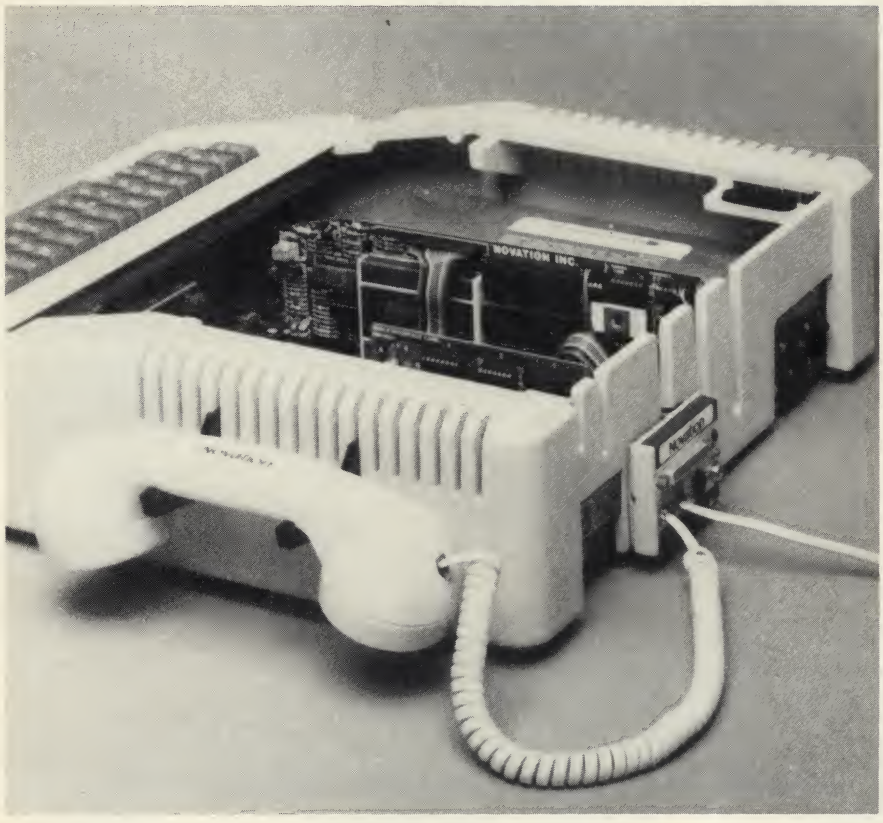


# A LOOK AT THE APPLE CAT-II COMMUNICATIONS SYSTEM

Reviewed by Ernest E. Mau

For a computer to communicate with a network or information service via telephone lines, two items are necessary: a modem (modulator/demodulator) to interface between the computer and telephone lines, and software to use the modem successfully. A practical, efficient hardware and software combination isn't always easy to find, often requiring a modem and software purchased separately from different suppliers.

Apple II and Apple II Plus users will find that Novation, Inc., has simplified matters with the Apple-Cat II Communications System. A single plug-in board installs easily into an expansion slot. No external boxes to position. No extra switches to change functions. No additional power connections. Just plug the board in and make a simple connection to the telephone lines.

Novation provides software called Com-Ware II with the system. All modem and communication functions are under direct software control and are driven from a 22-choice menu. A single keystroke selects operations like automatic dialing, loading a memory buffer from disk, loading memory with received data, transmitting memory to a remote system, viewing memory contents, and so on.

It's not possible to describe all functions and features in this limited space, so only highlights can be mentioned. For flexibility, the Apple-Cat II system accommodates 40- or 80-column displays, rotary or pushbutton dialing, input/output through either phone lines or an RS-232 serial interface port, and various data formatting options to match the connected system or network. It's compatible with Bell 103 systems at 110-, 150-, and 300-baud transmission speeds and with the Bell 202 system if needed. With a Bell 212 upgrade option, it provides 1200-baud communication. When connected to an external RS-232 device like a printer or another computer, it can accommodate data transmissions at 45.5, 50, 75, 110, 150, 300, 600, and 1200 baud.

All parameters are set up from menu or sub-menu selections and may be stored to disk for automatic activation when Com-Ware II is executed. The parameters can be changed in seconds to meet new requirements.

Convenience is the key feature of the system. Software and hardware work together for fast, easy, and reliable communication. The system automatically recognizes the presence of a 16K memory expansion card and loads the Com-Ware II program into that card where it doesn't interfere with the main working memory. The program disk can be removed after booting and replaced with a data disk, and the use of the 16K memory expansion allows a 27,781-byte buffer for capturing received data or holding data to be transmitted. That's sufficient for most network communications, and the buffer size exceeds the capacity of many popular word processors used to prepare or post-process data or the capacity of single transmissions to many networks.

With a one-key menu selection, memory may be loaded from disk, transmitted, loaded with incoming data during screen display, viewed separately on screen, dumped to a printer, or saved to disk. There's also direct access to DOS commands for disk manipulation. All this without breaking or interrupting the communications link. This is particularly convenient for users who process information through word-processing facilities. The ability to store ASCII text files or binary files in large segments is ideal for such applications.

Automatic dialing is standard. A user calls up the auto-dial function and then chooses to type a number, redial the last number, or dial a number from a stored list. Suppose several networks are used. The numbers are stored in the system with a few keystrokes and saved on disk. To dial one, type an "A" from the main menu for

auto-dialing, an "L" from the next menu for the list, and then the letter corresponding to the number and description appearing on screen. If a connection is broken, redialing the number requires only the "A" followed by an "R."

The system can be set up to originate calls only, answer calls only, or do an "auto-search" to originate or answer as necessary at any time. If left connected, equipped with an optional handset, and left powered all the time, it serves as an "intelligent telephone" through which both data and voice communications can be accomplished without having to disconnect and re-connect wiring. However, this probably is practical only if the user has two telephone lines and dedicates one solely for the Apple-Cat.

Novation also provides useful utility programs on the Com-Ware II disk that operate separately. For example, A-CONVERT changes Applesoft (Floating-Point BASIC) programs to binary files and binary files to Applesoft. I-CONVERT does the same for Integer Basic programs. T-CREATE turns Applesoft programs into ASCII text files. BSR allows control of BSR lamp and appliance modules through an optional Novation Expansion Module. CATPACK shows how to control the Apple-Cat II via machine language. CATREMOTE allows the Apple II computer to be controlled from a remote location. Often, such utilities are extra-cost items, if available at all. Novation includes them.

I've spent nearly 200 on-line hours testing the system, specifically but unsuccessfully seeking problems and flaws. Hardware and software have run reliably with no problems. One harmless fluke discovered was that a "syntax error" message pops up on screen during an auto-dial from the list, but it disappears instantly and doesn't halt or otherwise interfere with the system. You have to be fast to spot it, and even the Novation people missed seeing it for nearly a dozen tries when I called them. To find it, type "A" at the main menu for auto-dial, "L" for the list, and any letter to dial a number. When hitting that last letter, watch the lower part of the screen — the computer "beeps," the syntax error message pops on, the screen clears immediately, the status line reappears, and dialing commences. As I said, it doesn't hurt anything, it's just there. The Novation people aren't sure what causes it, but users shouldn't panic because it's not a fatal error.

My only other criticism is that I would like to see a "split-screen" option for 80-column displays. When using "live" or "real-time" conferencing, received messages overlay and garble lines being typed from the keyboard. The line transmits properly and doesn't send the interfering data, but it's hard to read or correct. If the screen were split so incoming messages appeared on one half and outgoing messages on the other half, conference applications would be simplified immensely. The people at Novation indicate they will consider such an option, but there's no promise of when or if it will be provided.

Overall, the Apple-Cat II Communications System has been an unqualified delight. At a suggested retail price of $389.00 for hardware and software, it's a bargain. For special needs, Novation also offers extra-cost options like an interfacing expansion module, firmware for writing new software applications, interfacing for cassette recorders, serial printer cables, and others. However, the options are unnecessary for normal network communications, and the basic Apple-Cat II arrives complete and ready to use after less than 10 minutes installation.

Information may be obtained from Novation, Inc., 18664 Oxnard Street, Tarzana, CA 91356. They may be reached by telephone at (213) 996-5060 or (800) 423-5419.

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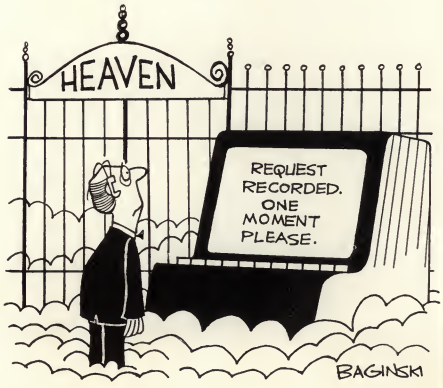
*Ernest E. Mau is a technical consultant and freelance writer from Denver.*





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Reviewed by William J. Lynott

Anyone who was around during the 1950s, '60s, or '70s is sure to remember the original Volkswagen "Beetle." How could you forget it?

The VW broke every rule in the book of automobile mania. In an era when American taste was inclined toward gaudy fins, shiny chrome, and mega-horsepower, millions of those scrawny, bizarre-looking Beetles could be seen on highways all over America.

How could they have become so popular? By what magic was the very essence of then-current standards suspended for their benefit?

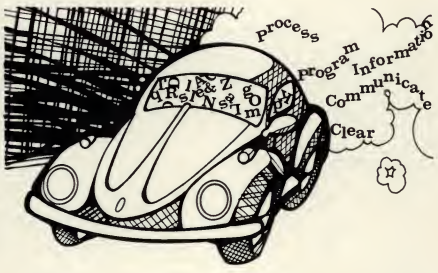
Just ask anyone who owned one. It was because they offered the best price/performance ratio of any automobile of the time — domestic or foreign.

It's a safe bet that Volkswriter author Camilio Wilson was well aware of the comparisons that would inevitably be drawn when he decided on the name for his new word processing program. While there are far more "elegant" programs on the market today, I doubt that any exceed the price/performance ratio offered by Volkswriter. While it is certainly possible to buy more "horsepower" or "style," it would be difficult to find a more functional package at a better price.

Volkswriter's documentation is an excellent sample of the new style emerging in the formerly arcane art of instructing non-experts in the use of computers. In addition to a handsome package featuring high quality printing, brevity, and easy-to-understand language, an on-screen tutorial leads the newcomer through a step-by-step introduction that should have almost anyone ready to go to work within a couple of hours. The company's telephone number and an invitation to call if help is needed are included in the on-screen tutorial.

Although I didn't encounter any problems that I couldn't eventually have figured out for myself, I trumped up a couple of technical questions to test the reception that a struggling new user might expect at Lifetree headquarters.

My call was taken by a cordial and very articulate woman who answered both questions quickly and accurately. She concluded with a sincere invitation to call again if I encountered further difficulty. This, of course, is the kind of support that every software buyer hopes for, but not everyone gets. The folks at WordStar, for example, still refuse to talk with an end user. If the dealer who sells you WordStar is unable to answer your question, you're on your own. Perhaps this is part of the reason that tiny upstart Lifetree (nine employees) has zoomed up to second place in sales of word processor programs for the IBM PC.




Illustrated Alaskan Moose

Volkswriter was the first commercial word processing program written especially for the IBM PC. This is reflected in the excellent use that is made of the IBM's ten special function keys. Used alone or in conjunction with the "alternate" key, the special function keys offer 20 high-speed functions at the stroke of only one or two keys.

All of the expected features are there: word-wrap, insertion and deletion, block move and block copy, custom formats, and right justification. However, if there is a single quality that separates Volkswriter from most of the other programs in its price category, it is speed. VW is lightning fast in many of the most important functions in a word processor.

Page scrolling, for example, is done almost instantaneously in either full-page or half-page increments. Realigning paragraphs after insertions or deletions is done a paragraph at a time. Instead of proceeding through to the end of the document each time a paragraph is formatted, Volkswriter stops when it encounters the next paragraph symbol. This makes it easy to reformat each paragraph as the need arises instead of realigning the entire document; and the whole process can be done in the wink of an eye.

Cursor movement, too, is fast. One very nice feature is the use of one of the special function keys to move the cursor from the first character to the last character on a line, or vice versa.

The block move and block copy procedures are simple and fast. Special function key F5 is used to mark the beginning of the block to be moved or copied, and F6 marks the end of the block. There is no limitation to the size of the block. One more key stroke places the marked text in the buffer for movement, and another dumps it in the spot determined by the position of the cursor. One feature that I do not care for in the block move/copy function is the ability to mark and move only complete lines. It is not possible, for example, to shift short phrases around within a sentence or paragraph. This is a minor annoyance, but one that ought to be easy enough for Lifetree to rectify.

Underlining is accomplished through the insertion of an extra line beneath the line containing the characters to be underlined. The additional line ends with a carriage return but no line feed. Thus, any underlining or overstriking inserted on the added line is printed right on the line above. The procedure works quite smoothly.

Unlike earlier versions, Volkswriter 1.2 allows the printing of headers and footers on each page at any line designated. If desired, automatic page numbering can be included. The page number is no longer printed on page one unless specifically requested.

Volkswriter supports a wide variety of both dot matrix and letter quality printers, including the new Smith Corona TP-1 and the Brother HR-1. The tutorial includes an invitation to call for help on any printer not listed among the many in the documentation.

Printing formats are created and saved as separate files. Thus, you can create a custom format for each of the types of documents that you process: correspondence, manuscripts, labels, legal froms, etc. By adding the proper extension to a file name when it is saved, the correct printing format will be retrieved whenever the file is retrieved.

The program will run under PC-DOS 1.0 or 1.1, and file management is easy and straightforward, since VW creates standard DOS files.

Another pleasant surprise is that Volkswriter is no longer copy pro-

tected. Making backup copies for your own protection is as easy as using the diskcopy command in DOS.

Are there any chinks in Volkswriter's armor? Well, yes. And that's to be expected since the perfect program is yet to be written.

The potential buyer should be aware that Volkswriter is something of a memory hog. Volkswriter is supplied in both a 64K and a 128K version. While the program seems to function acceptably on a 64K system, 128K of memory is strongly recommended for optimum performance. In earlier versions, the editing and printing modules were loaded into main memory separately as needed. The current version is much smoother with both functions loaded automatically at the same time. However, the program takes up to 45K or so of memory. When you add that to the room required for DOS, you're left with a maximum file size of 15K on a 64K system. That's about ten double-spaced manuscript pages. With 128K of main memory, maximum filesize is a much more ambitious 60K.

Unlike some programs such as WordStar which swap text back and forth from RAM to disk during editing, Volkswriter loads the entire text being edited into RAM. This is more of an annoyance than a serious problem, since many small documents can be linked and printed together as if they were one. All things considered, the use of a 128K system and two disk drives is best. This combination allows Volkswriter to show off its full range of tricks.

Volkswriter is also quite limited in screen formatting capability. Page breaks, for example, cannot be viewed on the screen, though it is possible to force page breaks in spots where you do not want a solid block of text broken up by a page break. The only screen formatting, in fact, is the ability to set the right margin. The inability to "preview" what the final printed version will look like is another minor nuisance.

As is the case with other programs, the search and replace function is unable to ignore case. If you are searching for "Technician," for example, Volkswriter will pass right over "technician" without ever seeing it. This could be worrisome for the unwary, but once you know about it, it's easy to handle. In the above example, just search for "echnician."

There is no way to write about Volkswriter without being tempted to abuse the obvious metaphor. At the risk of being accused of just that, let me say that for the word processing traveler, Volkswriter is solid, dependable transportation at a price that would be mighty hard to beat.

*William J. Lynott is a free-lance writer from Philadelphia.*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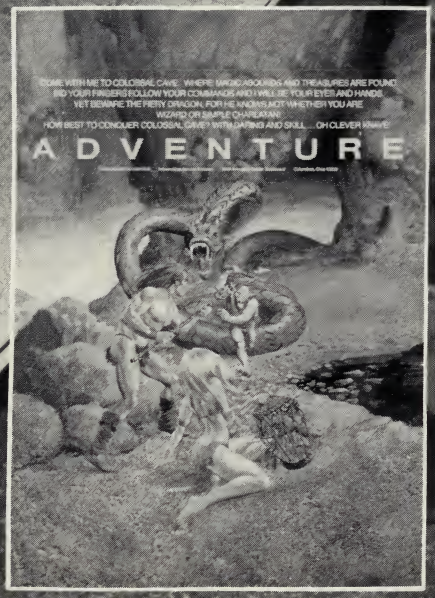


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# TELETEXT AND VIDEOTEX IN THE UNITED STATES: Market Potential, Technology, Public Policy Issues

by John Tydeman, Hubert Lipinski, Richard P. Adler, Michael Nyhan and Laurence Zwimpfer
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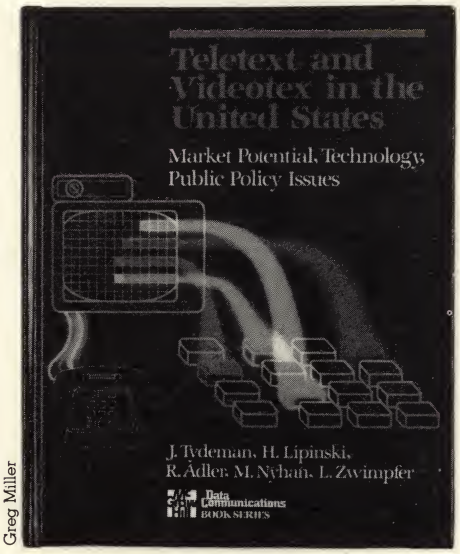
Reviewed by John Edwards




Greg Miller

Videotex, teletext — it's all very confusing. Remember when the most complicated thing we could view on our televisions was a PBS documentary? Well, those days are gone forever. Today's electronic information revolution is rapidly turning our TVs (and computers) into vast storehouses of human knowledge.

Yet, for all of their incredible potential, the topics of videotex and teletext continue to remain mysterious to the average person. One wonders whether many casual users of these services are able to recognize either name. It's this information gap that Teletext and Videotex in the United States aims to bridge.

Just in case you're one of those people not familiar with the terms, teletext is the generic name that describes one-way information services (such as the news and sports pages you've probably seen on cable TV), while videotex refers to two-way information resources (like CompuServe). Both technologies are similar in that each attempts to be a substitute for such services as TV and radio news, telephone dial-it services and parts of newspapers, while also providing such new methods of communication as teleshopping and information retrieval.

Written by five members of the Institute for the Future — a California-based "think tank" — *Teletext and Videotex in the United States* is a comprehensive study that attempts to assess the impact of both services on our nation over the next two decades. The bulk of the work is based on the findings of a National Science Foundation report the institute conducted that examined the standards, experiments, applications, and implications of home-based retrieval systems. Included in the text are examinations of such diverse areas as public policy issues, service technology, societal impacts and system methodology. CompuServe users will be particularly pleased to find a complete rundown of the service's history and operation.

*Teletext and Videotex in the United States* is a book that works on at least two levels. As a research tool, it is without equal. The authors have painstakingly analyzed every facet of the two services, both in the United States and abroad, and provide their readers with complete reports on each of the fields' various networks. On another level, the book is also a "good read." Granted, the prose does lean toward the dry and scholarly, but the subject itself is so exciting, and the projections for the future so enticing, that the material virtually carries itself.

While the book's hefty price of $34.95 may deter some, those willing to swallow the cost will find the work an excellent source of information on two exciting frontiers. By all rights, it should become the bible of the home-based information retrieval systems industry.

# PERSONAL GRAPHICS FOR PROFIT AND PLEASURE ON THE APPLE II PLUS COMPUTER

by Michael P. Barnett and Graham K. Barnett
$14.50, 192 pp.
Little, Brown and Company

Reviewed by Earle Holland

There's probably a secret craving deep in the minds of nearly all owners, or would-be-owners, of personal computers to create on their machines what they see in video arcade machines; daydreams of creating their own versions of "Tron" right there before them.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Alas, for most of us, that will never happen.

Home computers, like the Apple II Plus, are designed to serve multiple purposes and, therefore, may trade off some specific capabilities for the ability to perform a whole host of duties.

But that's not to say that graphics and animation on machines such as the Apple II Plus are limited. Just the opposite is probably true. Home video games may give you elaborate images but you're at a loss to figure out how they're created. The Barnetts' book offers you just that.

When I told my six-year-old son, a "Centipede" aficionado, that this book offered a graphics program of the same name, you could see the visions of squirming centipedes, dancing spiders, and a forest of mushrooms twinkling in his eye.

You could also see his dreams crumble when he realized this wasn't the game he loved. It was, in fact, only a set of small boxes with stick legs that moved jerkily across the screen.

But then he began to realize that he was controlling it — not reacting to it as he was used to. The twinkling returned.

It's easy to imagine Michael Barnett sitting in similar fashion with his son Graham as the two discovered such wonders. And that is precisely how this book came to be.

The book provides a host of simple programs which the authors explain can serve as prototyes for later experiments in computer graphics and animation.

They begin with the simplest of subjects — a crude face using the Apple's low-resolution graphics capability. Lines form eyes, a nose, and mouth. The eyes can wink. The mouth will smile.

It'a the most rudimentary of stuff — a far cry from the computer animation we drool over. But it's meant to be a beginning. From there, the Barnetts offer a dog with a wagging tail, a robot that flees from raining arrows, and the centipede program.

In each case, they offer a recipe for beginning graphics that work, and a few variations on the theme. Later chapters take up actual "drawing" on screen, shapes that range from circles and cubes to abstract conglomerations of lines, to pie graphs and bar graphs for displaying data. Towards the end, the book offers advanced exercises including a kaleidoscopic effect that's surprising indeed.

All in all, the book is an excellent primer for bringing the new Apple owner into the world of computer graphics.

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# COMPUTER-MEDIATED COMMUNICATION SYSTEMS

by Elaine B. Kerr and Starr Roxanne Hiltz
210 pp.
Academic Press, Inc.
New York, New York
$26.50

Reviewed by Carole Houze Gerber

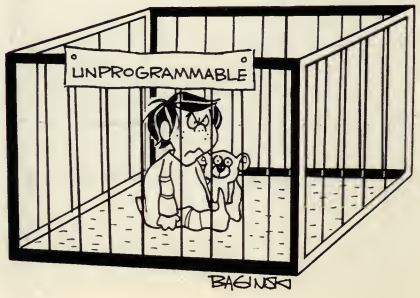
*Computer-Mediated Communication Systems*, written by two sociologists trained at Columbia University, is a well-researched, well-written synthesis of the current knowledge about computerized conferencing systems, electronic mail, and office information-communication systems. The authors state in the preface that the book should be of interest both to students and researchers studying this new form of electronic communication and to organizations planning to install computer-mediated systems. It will also be of interest to home computer owners who want to learn more about the the impacts that computer-mediated communication may have on individuals and groups.

Other major areas addressed by Kerr and Hiltz include identifying the important considerations in designing software or choosing a system from among the many options; the factors affecting the acceptance or rejection of these systems; and descriptions of the major kinds of "evaluational strategies" used to implement computer-mediated systems. While this book is not light reading — nor is it meant to be — for a "scholarly work," it is remarkably clear and concise. Charts, definitions and a liberal use of subheads assist the reader in zeroing in on specific topics. A 20 page appendix lists background information on the systems and studies covered by the authors.

In studying the effects of computer-mediated communication systems on individuals and groups, Kerr and Hiltz conducted a comprehensive literature review and gathered responses from a panel of experts. Like most scholars — social scientists, in particular — they are reluctant to make unequivocal statements of fact. However, the authors do make what they call "informed guesses" that network users will find fascinating. Etiquette and social conventions may change, they hypothesize. And computer conferencing may be used by prisons to aid in rehabilitation programs. They also present the idea that contacts between scientists, businessmen, and government officials may improve.

Kerr and Hiltz have delved into an area begging for examination and have presented an excellent sociological overview of computer-mediated communication. Theirs is not the final word and the authors point out that a good deal of future research is needed as use of on-line communication proliferates. Although obviously a technologically-based medium, the authors view computer-mediated communication systems as a social invention designed to improve communication and, ultimately, white collar productivity.

To order *Computer-Mediated Communication Systems* contact Joan Ziehl, Academic Press, Inc., Commercial Division, 111 Fifth Ave., New York, NY 10003.

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The leading word processor for microcomputers, WordStar, can now explain itself in friendly human terms, even to a first-time computer user.

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Titled *How to Use WordStar*, the cassette tapes can be used with any computer that runs WordStar. Also included with the course is a fully-indexed user's guide that summarizes all key ideas and procedures from the lessons. With the need for reading and note-taking eliminated, the learner is free to concentrate on the screen and keyboard, trying each command and seeing the results.

*How to Use WordStar* sells for $49.95. For information contact Flip-Track Learning Systems, a Division of Mosaic Media, Inc., 526 N. Main St., Box 711, Glen Ellyn, IL 60137.

## NEW AMDEK MAI BOARD

Amdek Corp. has developed a new IBM/PC-compatible Multiple Adapter Interface (MAI) board that provides memory extension, monocrome or color video and a printer adapter on a single plug-in module.

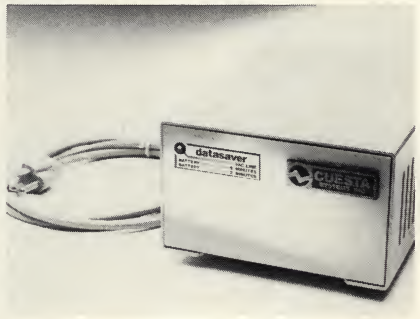
The new board contains 128K bytes of DRAM that is user allocated to the given function. A two position DIP switch is used to configure the board for monochrome video display or color graphics applications. In addition, the user can access the display memory at any time providing interference-free performance while screen editing is operating at full speed. The MAI board eliminates the need for a separate printer interface adapter.


For additional information on the MAI board, which retails for $799, contact Amdek Corp., 2201 Lively Blvd., Elk Village, IL 60007.

## DATASAVER

Datasaver®, a product from Cuesta Systems, Inc. that enables computer users to safeguard both the time and the data contained in their systems against unexpected power failures, has received certification from CSA, a Canadian government agency. The product also conforms to applicable UL and FCC requirements.

The unit consists of a rechargeable sealed battery, automatic battery charger, solid-state power inverter, AC line voltage conditioner and monitor and high-speed AC transfer switch. An overvoltage transient suppressor, visible and audible alarms, electronic interrupt signal and auxiliary 12 volt battery jacks are provided.




The 90 watt Datasaver is capable of powering most portable microsystems and the 200 watt unit provides protection to desktop computers.

For additional information contact Cuesta Systems, Inc., 3440 Roberto Ct., San Luis Obispo, CA 93401.

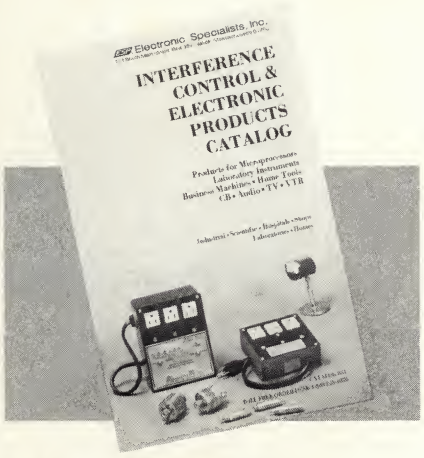
## QDP-100 MICRO

The QDP-100 microcomputer fits the needs of business and professions because it is more powerful and faster than most microcomputers, say the manufacturers, QDP Computer Systems.

This eight-bit, S-100 bus unit is expandable and upgradable, allowing for growth and adaptation of new technical developments without major modification.

The QDP-100 uses CP/M or MP/M operating systems, which are widely accepted as the industry standard and allow selection of the broadest range of software.


For information contact QDP Computer Systems, 10330 Brecksville Rd., Cleveland, OH 44141.




## ELECTRONIC SPECIALISTS CATALOG

Electronic Specialists has published a 40 page catalog of its line of computer interference control products. Protective devices for smooth software operation include equipment isolators, AC power line filter/suppressors, line voltage regulators and AC power interrupters.

Descriptive sections are included, which outline particular computer problems and suggested solutions. Typical applications and uses are highlighted.

To receive a copy request catalog 831 from Electronic Specialists, Inc., 171 S. Main St., Natick, MA 01760.

## PRINTERS FROM NEC

NEC Information Systems has developed two new products that are especially useful for word processing.

The Pinwriter™ series of printers are a new family of low-cost high quality dot matrix printers that are ideal for use with personal and small business systems. They produce dot formed characters at rates up to 180 characters per second, while offering near letter quality output at slower speeds.

Three models are available, all of which are compact, multi-mode serial 18-pin printers. Prices range from $799 to $1,250.

In addition, NEC has added a 70,000-word dictionary to its Astra Series Word Processing to allow for the automatic verification of word spelling and hyphenation. Produced in conjunction with Houghton-Mifflin Company, the product also includes a user dictionary for the addition of company logotypes, trademarks and frequently used industry terminology.

For information contact NEC Information Systems, Inc., 5 Militia Dr., Lexington, MA 02173.

## NEW FROM DIGITAL MARKETING

Digital Marketing has introduced two new software products designed to improve office organization — electronically.

Office Filer™ is an electronic filing system designed to complement the IBM/PC, by teaming the PC's function and cursor control keys to make it easier, faster and more versatile than other database managers.

The Office Filer user is not required to know programming-type activities to maintain the database. Rather, the user creates a FORM, or fill-in-the-blank format, to enter the data. FILES are collections or completed FORMS and may be password protected. REPORTS may be user-created with the same word processing-type text-editor used to create a FORM.

Office File retails for $395.

Also new is The Specialist™, a medical billing and accounts receivable package developed with the needs of the specialist in mind. It is available for five specialty practices, anesthesiology, family practice, internal medicine, radiology and surgery and can be used by a single doctor or for a multiple practice of up to nine physicians.

The Specialist is menu-controlled, with three levels of password control. There is seldom need to refer to the manual. It gives the user flexibility in entering charges as units or flat fees for procedure. Billing and service dates are both kept on file for specialists who bill several weeks after a service. Payments may be posted on an open item or balance forward account basis.

The sole practitioner version sells for $995 and the multiple practitioner retails for $1,295. A version which combines both the sole and multiple practitioners is available for $1,495.

For information contact Digital Marketing, 2363 Boulevard Circle, Suite 8, Walnut Creek, CA 94595.

## TECHNICAL EDUCATIONAL RESEARCH CENTER, INC.

When the school bell rings its final chime in June many teachers head back to the classroom — only this time as a student.

Teachers and administrators at all levels — from elementary through college — who want to learn more about microcomputers in education can take advantage of a series of four-day hands-on workshops sponsored by Technical Education Research Center, Inc. (TERC).

The following classes will take place at the TERC offices, 8 Eliot St. in Cambridge, Massachusetts:

**June 20-23**
"Microcomputers in the Science Lab"

**June 27-30**
"Trainer Preparation Workshop"

**July 5-8**
"Software Development Workshop"

**July 25-28**
"Logo"

**August 1-4**
"Simulations"

**August 8-11**
"Pascal"

**August 15-18**
"Logo"

In addition, a special series of workshops on math, science and computer literacy will take place at Trinity College in the Green Mountains of Vermont. Participants will receive a broad exposure to microcomputer applications in intensive workshops which will prepare them for leadership roles in the field of microcomputers in education.

One or two week sessions are offered from July 11-15 and July 19-22. Topics include microcomputers in elementary math and science, Logo, BASIC, computer awareness and computer literacy, microcomputers in algebra, geometry, trigonometry and calculus and more.

For further information contact TERC at 8 Eliot St., Cambridge, MA 02138.

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The quality of Wabash diskettes is stressed throughout the entire manufacturing process. After coating, all Wabash diskettes go through a unique burnishing process that gives each diskette a mirror-smooth appearance. Wabash then carefully applies a lubricant that is specially formulated to increase diskette life. Then, to keep out foreign particles, a unique heat seal bonds the jacket and liner together to help prevent contamination. After 100% hypercritical testing and certification, Wabash then packages each diskette, (except bulk pack) in a super strong and tear resistant Tyvek® evelope. The final Wabash product is then shrink-wrapped to insure cleanliness and reduce contamination during shipment. Wabash diskettes are so very reliable that Wabash now offers a six year warranty in case of defects in materials or workmanship on all diskettes purchased directly from Communications Electronics.

## New...Wabash Diskette Duplication Services

Communications Electronics has teamed up with Wabash to provide a single-source solution for the diskette duplication requirements of software developers, OEM's and distributors. All service is in-house, to give you fast, dependable service. In most cases, delivery can be completed in five days. Whether you require 100, 1,000, or 10,000 copies per week, call CE first for a no obligation price quote. For additional information, please write us on your letterhead with your requirements.

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| 8" SSDD IBM Compatible (128 B/S, 26 Sectors) | F131 | 2.39 |
| 8" DSDD Soft Sector (Unformatted) | F14A | 2.99 |
| 8" DSDD Soft Sector (256 B/S, 26 Sectors) | F144 | 2.99 |
| 8" DSDD Soft Sector (512 B/S, 15 Sectors) | F145 | 2.99 |
| 8" DSDD Soft Sector (1024 B/S, 8 Sectors) | F147 | 2.99 |
| 5¼" SSSD Soft Sector w/Hub Ring | M11A | 1.49 |
| 5¼" Same as above, but bulk pack w/o envelope | M11AB | 1.29 |
| 5¼" SSSD 10 Hard Sector w/Hub Ring | M41A | 1.49 |
| 5¼" SSSD 16 Hard Sector w/Hub Ring | M51A | 1.49 |
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| 5¼" DSDD 16 Hard Sector w/Hub Ring | M54A | 2.69 |
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| 5¼" Tyvek Diskette Envelopes - Price per 100 Pack | TE5 | 12.00 |

*SSSD = Single Sided Single Density; SSDD = Single Sided Double Density; DSDD = Double Sided Double Density; SSQD = Single Sided Quad Density; DSQD = Double Sided Quad Density; TPI = Tracks per inch.*


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R.C. Morse

# EXAMINING EUROPEAN VIDEOTEX STANDARDS

Setting standards is an important but controversial question in any field. In videotex, for example, standards allow for many things: the most important being formats for page structure, graphic capability, and handshaking between different standards. If standards are incompatible, a videotex system is isolated. While connection can be made via gateway, communication can't happen. In America, every company, every manufacturer, every system operator can have his own standard. That's a function of a free market place.

But Europe is a different story. European countries are far more socialized in nature, with governments directly intervening, and even controlling, the actions of public or private business. For example, telecommunications are controlled by the governments of each country, generally by the PTT (the Postal, Telephone, and Telegraph authority) which may or may not also directly control television.

In America where the government sets no standard, the marketplace decides standards in a free enterprise mode. Such is already the case with video games. Atari and Mattel are incompatible — they each set their own standards. Other companies, like Coleco, come in and manufacture products compatible with each standard. And while all these go after the TV hook-on market (the videogame is connected right to the TV for display), there is now even a stand-alone system on the market that comes with its own high-resolution screen. Thus the market goes its own way.

Meanwhile across the Atlantic, where regulation is the order of the day, the field of videotex is very different, yet what has resulted is in some ways similar to what happened here. To make it simple: the U.K. developed the Prestel standard for videotex, which has been adopted by a number of European countries. Concurrently, the French developed another standard — the Antiope standard, and the Canadians developed the Telidon standard. In and of themselves, they are all incompatible. The solution was, obviously, to adopt a superstandard that would be compatible with all the nationalistic subsets.

In a way, the move toward commonality of purpose began in the U.K. The post office had come up with a prototype videotex standard, or rather, a number of them in about 1974. Each work on videotex was pioneering. No one in Sam Fedida's group had any guidelines from which to work. No one told them to go with a 24 x 40 format (24 rows of 40 characters each) — it was something that just more or less happened. As it was, according to Richard Simmons, one of those young, fresh-out-of-school engineers working with Fedida, a number of formats were developed and experimented with. By the mid-1970s, it was recognized that viewdata should be made compatible with teletext, the vertical blanking interval technology like viewdata but not interactive, and sent out in the TV broadcast signal rather than by phone lines.

Both the British Broadcasting Corporation and the Independent Broadcasting Authority (Britain's commercial television network system) were separately and independently developing teletext systems. In a milestone of cooperation, all three parties — the post office with viewdata and BBC and IBA with teletext — agreed to a common standard — the 40 x 24 format in an alpha-mosaic graphic mode. This facilitated a number of things, chiefly insuring intermedium compatibility and aiding in chipset development and deployment. In the U.K., the driving force behind chipset development has been a Philips subsidiary, Mullard.

As British videotex was developed, its future was also insured by building in capability for expansion to more sophisticated graphic levels. Level 1 — basic alpha-mosaics — took 12 years to implement. Under this mode, graphic representation of objects, logos, or illustrations are created via matricies of dots, rather than by pixels. These matricies form rough, jagged lines when representing curved shapes, which look very much like mosaic tiles for which they are named. It is the crudest form of graphic representation, but also the least expensive, as no additional memory is required in the decoder.

Like the British, the French also started development of videotex, or "videographie," as it is known in France, in an alpha-mosaic format. Antiope, however, differs from Prestel in page format — the Antiope page is set up on a 32 x 20 format. Thus the Antiope and Prestel formats were incompatible — a problem for other European nations using either of the systems. While Prestel is the dominant standard, not every European nation uses it, and some even use both Antiope and Prestel standards within their own boundaries.

To complicate matters even more, Telidon from Canada offered superior graphic capability operating on the alpha-geometric mode. Alpha-geometrics are drawn directly with pixels, rather than by 6 x 8 or 2 x 3 dot matricies. The resulting shapes are more like the real thing, as they are drawn with actual geometric shapes. Telidon, incidentally, was the result of computer graphics research. On the viewdata ladder, it operates at Level 4 — way above the Level 1 mosaics of Prestel or Antiope. However, a great deal of memory is required in the decoder, driving the cost of alpha-geometric system way above that for mosaics.

The value of geometrics, however, is perceived as a necessity for commercial systems where advertisng will play a large role. With geometrics, a logo looks like a logo, something of appeal to marketers in particular.

Back in Germany, it's all falling into place: The Deutsche Bundesposte has

## Coming in the July Issue of TODAY

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stated that implementation of Bildschirmtext as a commercial, national videotex service will operate on the CEPT standard.

In actuality, CEPT isn't an official standard — yet. Recognition is expected to come later this year from the world's international standards committee (CCITT) when it convenes to deliberate this very matter.

The concept has been more or less adopted by more than two dozen European nations. Other factors have clouded over what was to be a superstandard. Primary here is the relation of CEPT to the North American standard called NAPLPS. Will CEPT be specified as a subset of NAPLPS? Or will the two superstandards remain incompatible in every form other than silicon?

In Germany, Bildschirmtext will roll out specified for the CEPT format, though operating at Level 3 — alphamosaics with DRCS graphic capability. DRCS stands for Dynamically Redefineable Character Sets. In its simplest sense, DRCS allows for the break-up of the dot matrix, and for its redefinition of shape, form, and characteristics.

Basically, what you get from DRCS is a way of imitating geometrics without needing all the memory required for geometrics. DRCS works at a low memory capacity since it generally is used in only a portion of the screen. Mullard will pioneer development of the chips necessary for CEPT implementation. Indeed, development has been going on for several months already to the tune of over a million dollars. Production of the new chips is scheduled for next year, and is already being characterized as a chip for the mid-to late-80s.

In the meantime, work has already proceeded to the point of alphageometric capability (Level 4) by at least one Austrian concern which last year unveiled the Mupid terminal. Mupid is capable of supporting mosaic and geometric operating modes. Other terminal manufacturers seem to be considering manufacture of a terminal with a physical switch to change from mosaic to geometric operating modes.

*This column is provided by ISIS — Internationally Syndicated Information Services, a New York City-based company specializing in new electronic media reporting, analysis, and consulting. This column is composed on an RCA VP3501 Videotex Data Terminal.*

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### How Networks Operate

*Continued from page 20*

this trial. It has attracted world-wide notice, with inquiries coming from as far away as Australia. When the technical trial is finished, iNet will go through a year of market trials before becoming a commercial service. INet's developers hope it will eventually list most databases.

#### MI/NET

Early this year Telenet introduced a specialized service for doctors called the Medical Information Network or MI/NET that uses a similar intelligent network idea. The result of a partnership with the American Medical Association (AMA), the service originally offered four medical databases including one carrying the AMA's entire encyclopedia of every perscription drug, its uses and side effects. Three more medical databases are to be added soon. If MI/NET proves successful, Telenet will undoubtedly create other specialist intelligent networks for other professions.

The greatest service of an intelligent network may be its list of what is available. Although most common carrier packet networks publish guidebooks listing the databases they reach, new ones appear so fast these lists are out of date by the time they are printed. Today thousands of databases are available worldwide, and the list grows daily. Although many are provided by universities and other nonprofit organizations as a spinoff of their normal research activities, others, like Lockheed's Dialog, are profit-making branches of corporations. This growth, more than anything else, is a measure of the real strength of computer communications. It indicates that this field will grow until it becomes one of the world's largest industries and creates the reality of the electronic world village.

*G. Berton Latamore is a free-lance writer from Providence, R.I.*

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